THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY
April 25, 1988 · Vol. XXII · No. 17 · 140 Pages · $2/Copy · $44/Year

COMPUTERWORLD

INSIDE

Spotlight — Electronic publishing gains corporate stature. Pullout section follows page 72.

In Depth — Bring order to systems development anarchy. **Page 73.**

DEC's Calypso party includes VMS 5.0 and clusterwide software licensing options. Page 6.

MSA retrenches, seeks comfort in the embrace of IBM systems. Page 8.

Converts flock to EDI conference for tips on selling corporate management the advantages of paperless billing and invoicing. Page 14.

AT&T's Olson dies; company names Allen chairman. Page 7.

RISC parade grows, with Motorola signing up 20 systems vendors for latest chip set. Page 109.

AI tools at Chase Manhattan to eliminate hassles of processing telex traffic. Page 55.

CDLA names one of its own, Econocom Chairman Kenneth A. Bouldin, to direct the leasing association. Page 4.

Scientists want 3G bit/sec. nationwide fiber-optic network. Page 2.

IBM propels DB2 into data base top spot

BY CHARLES BABCOCK
CW STAFF

NEW YORK — IBM tapped the resources of its new MVS/ESA operating system last week to push the throughput of DB2 up to 186 transaction/sec. or higher.

The company also upgraded a host of other MVS subsystems, including the nonrelational IMS data base management system, so the systems can make greater use of the virtual memory and automatic memory management available under MVS/ESA (see story page 108).

The startling performance gain of DB2, combined with the addition of referential integrity, prompted IBM officials to pronounce its relational product capable of replacing the deeply entrenched IMS for new applications — a step they declined to take with DB2's initial three releases.

"I would recommend a customer attempting to build a new system ask himself, 'Why not DB2?' It is good for well into 90% of application usages," said Gary J. Ferdinand, manager of advanced data base products at IBM's San Jose, Calif., General Products Division.

Continued on page 108

Ramping up
The latest DB2 uses IBM's MVS/ESA to attain transaction rates approaching those of IMS

DB2 Release 1.3	**MVS/XA**	**3090 Model 200**	**52**
DB2 Version 2.0	**MVS/ESA**	**3090 Model 600E**	**186**
IMS Full Function	**MVS/XA**	**3090 Model 400**	**200**

INFORMATION PROVIDED BY IBM
CW CHART

Mistrial for optical system

Technology delivers in court, but witnesses balk

BY JAMES A. MARTIN
CW STAFF

SAN BRUNO, Calif. — It was to be the first time in history that optical storage technology would be used throughout a trial in a courtroom setting, with witnesses, attorneys and the presiding judge examining digitized reproductions of paper evidence on CRT screens.

But what sounded great in theory proved unsuccessful in practice. After a five-month trial run, the optical storage system purchased by California's San Mateo County for use in a $2 billion Shell Oil Co. lawsuit against 35 insurance companies has been pulled out of the courtroom.

The problem, ironically, was not the judge. Although there are those in the judicial system who remain uncomfortable with evidence submitted on optical disk or image processing systems, presiding Judge William Lanam supported the use of the technology in this complicated trial from the beginning.

The problem was not with the technology. The Filenet Corp. document image processing system, based on AT&T's Unix operating system and Motorola, Inc.'s 68000 microprocessors, performed as expected in storing and retrieving the reams of paper involved in the proceedings.

Reluctant witnesses

The system failed in the courtroom because neither the witnesses nor the attorneys involved in the case were comfort-

Continued on page 109

Micro Channel cloned

BY JULIE PITTA
and ALAN ALPER
CW STAFF

Fellow Texans Tandy Corp. and Dell Computer Corp. last week became the first personal computer makers to announce clones of IBM's Micro Channel architecture-based Personal System/2s. The moves were seen as attempts by both companies to capture the attention of corporate America as leading-edge PC makers.

Tandy, hampered by a reputation as a retail electronics supplier, and Dell, which has made its name in mail order, have looked to broaden their business into Fortune 1,000 accounts. Both companies have added larger outbound sales

Continued on page 4

MANAGEMENT PROFILE

He changed the rules in banking

BY GLENN RIFKIN
CW STAFF

Phyllis Diller was as ugly as a woman could be who actively worked at it. But she made Johnny Fisher laugh like hell in 1962 when she played in a supper club in Columbus, Ohio. So Fisher convinced the comedienne to do some television commercials for City National Bank, where he was in charge of marketing.

It was the kind of brazen move that would characterize Fisher's 28-year career at the bank — a career in which Fisher, now senior vice-president, has emerged as the foremost coupler of computer technology and marketing in the banking industry.

The ads caused predictable results in the sleepy town in the early 1960s. The bank president called. "Johnny, several of

Banc One's Fisher

the bank's directors think you ought to take her off the air. Do you understand this is the ugliest woman I've ever seen? After all, we're a bank." But Fisher already understood back in 1962 what P. T. Barnum said about getting noticed: You've got to wiggle your ears.

City National, now Banc One Corp., was the third largest bank in Columbus in the early 1960s, dwarfed by Bancohio National Bank across the street and "dead in the water," according to Fisher. With just $300 million in assets and the prospects for growth grim, Fisher started to wiggle his ears.

Fisher not only understood television and outlandish comediennes, but he also had a prescient view of computers and data processing and what they could do for the banking business. During the next three decades, despite two notable setbacks, Fisher revolutionized the banking industry by driving the marriage of technology and marketing at Banc One in innovative ways.

He helped bring the credit card to U.S. consumers, turned

Continued on page 84

NEWSPAPER
[illegible]-DIGIT 48106
CN 069705Z3 [illegible]
UNIVERSITY MICROFILMS INT DIR
SERIAL PUBLICATIONS
300 N ZEEB RD
ANN ARBOR MI 48106

SECOND CLASS

IN THIS ISSUE

Calypso beat. DEC brings symmetrical multiprocessing to the heart of its VAX line via VMS Version 5.0 and the VAX 6200 series. Code-named Calypso, the series consists of one to four Microvax 3000 CPUs and uses a 100M byte/sec. internal bus. Page 6.

Assault with battery. Zenith strengthens its position in the laptop arena with a battery-powered 386-based computer that features a high-contrast display and a 40M-byte hard drive. Page 108.

NEWS

4 Compaq, AST earnings show no sign of threat from PS/2.

4 Bouldin named president of CDLA.

6 VMS Version 5.0 includes "things VMS bigots are going to love to get their hands on."

6 CDC renews Cyber line with six mid-range mainframes.

7 Allen succeeds Olson as AT&T chairman, chief executive.

8 ONA plans get thumbs-down from users, vendors.

8 MSA abandons multiple platforms in favor of IBM strategy.

10 Apollo slashes prices on Series 4000 workstations.

10 Computer Consoles designs RISC-based chip set.

14 Lack of EDI puts firms at competitive disadvantage, advocates say.

15 At 3Com, EDI is a way of life.

16 Business functions all in a day's work for CIM.

17 "What you don't see is what you need," marketing executives at publishing conference say.

108 IBM makes sweeping upgrades to MVS subsystems.

109 Vendors back Motorola's RISC move.

109 DG discloses plans to use Motorola chip set in future systems.

109 Financial picture getting brighter for DG.

109 Tandy rewrites erasable optical disk history.

SOFTWARE & SERVICES

25 Chairman Imlay says acquisitions hurt MSA profits in '87.

25 CASE consultant: Focus on quality.

25 Nastec interface links CASE system, Paseophic's Telon.

Unifying departments through document sharing. Follows page 72.

MICROCOMPUTING

31 Lack of applications an OS/2 turnoff.

31 DEC hookup lures techies to Apple fold.

31 Ampro package burning up software market.

NETWORKING

55 Chase AI system routes incoming telexes.

55 Users want something that works.

55 IBM uses EDI to link user hosts, value-added net.

SYSTEMS & PERIPHERALS

67 Vendors weather monetary fluctuations.

67 Okidata adds to family of dot matrix printers.

67 HP introduces first SCSI cards and disk drives.

MANAGEMENT

79 MIS pros, users air woes: each other.

79 Systems integrators fuel demand for professional services.

79 Laser disk training rates high.

Quotable

"I would recommend a customer attempting to build a new system ask himself, 'Why not DB2?'"

GARY J. FERDINAND
IBM

See story page 1.

COMPUTER INDUSTRY

87 First-quarter earnings reports robust.

87 IBM sinks $15 million into Metaphor.

87 Cullinet shuffles executive deck, Litwack resigns.

COMPUTER CAREERS

90 Wanted: Manufacturing applications specialists.

TRAINING

105 Effectively marketing advanced training.

TRENDS

110 IBM's 9370 takes a bite out of the System/36, 38 market.

SPOTLIGHT

Organizations struggle to bring electronic publishing into the systems fold. **Follows page 72.**

IN DEPTH

73 Let peace and order reign over software development chaos. By Fred Viskovich.

OPINION & ANALYSIS

19 Newquist thinks about intelligent text retrieval.

25 Babcock enters a new area of relational data base use.

31 Barney fabricates a what-if scenario.

55 Betts counts the FCC chairman's squandered chips.

67 Savage tells the truth.

79 Reed lives to tell about a drug test.

87 Wilder peruses the latest lists.

DEPARTMENTS

18 Editorial

82 Calendar

99 Marketplace

110 Inside Lines

NEWS

Nationwide net sought

Funding woes keep high-tech dreamers tossing

BY MITCH BETTS
CW STAFF

WASHINGTON, D.C. — The U.S. science community likes to think big. At a conference last week, the nation's research institutions said they want a nationwide fiber network capable of transmitting data at speeds of up to 3G bit/sec. within 15 years.

"Imagine a global information technology-induced university," said one speaker, Donald N. Langenberg, chancellor of the University of Illinois in Chicago.

The problem is, no one knows how to pay for such a project. This so-called funding problem, as well as questions about how to develop and manage such a meganetwork, were issues at the National Net '88 conference.

Of the conference's 319 attendees, 137 were information systems managers from North American universities or research laboratories who said they want to connect their campuswide networks to the national backbone network.

'Enormous task ahead'

"It was clear to me that we have more problems than solutions, and we have an enormous task ahead of us," said Kenneth M. King, president of Educom, a Princeton, N.J.-based nonprofit consortium that helps colleges and universities apply information technology.

The lofty goal for the national education, research and development network is to link about 100 special-purpose and regional research networks so that scientists and students in different areas can collaborate.

Scientists said the huge bandwidth is needed to handle the volume of data and the thousands of users contemplated. For example, in order to transmit a moving, full-color image generated by a supercomputer, a bandwidth of nearly 1G bit/sec. would be needed to transmit the 30M-bit image at a rate of 30 frames per second.

The tentative plan is to upgrade existing networks to the T1 level, tie them together into a virtual network and develop an architecture for the 3G bit/sec. backbone network.

The National Science Foundation's NSF Net and the New York State Education and Research Network are considered models and building blocks for the national network.

The White House Office of Science and Technology Policy endorsed the plan last November, and the idea is also championed by such industry luminaries as Gordon Bell, vice-president of Ardent Computer Corp.; Ellen Hancock, an IBM vice-president; Robert Kahn, the father of Arpanet; and Erich Bloch, of the National Science Foundation.

IBM seeds developers with OS/2 Extended beta code

BY STEPHEN JONES
CW STAFF

Software developers took their first look at beta code for the most advanced versions of IBM's OS/2 operating system last week. The OS/2 development kits provide the first strands of source code that top commercial and corporate developers will use to write a spate of Extended Edition and LAN Server applications.

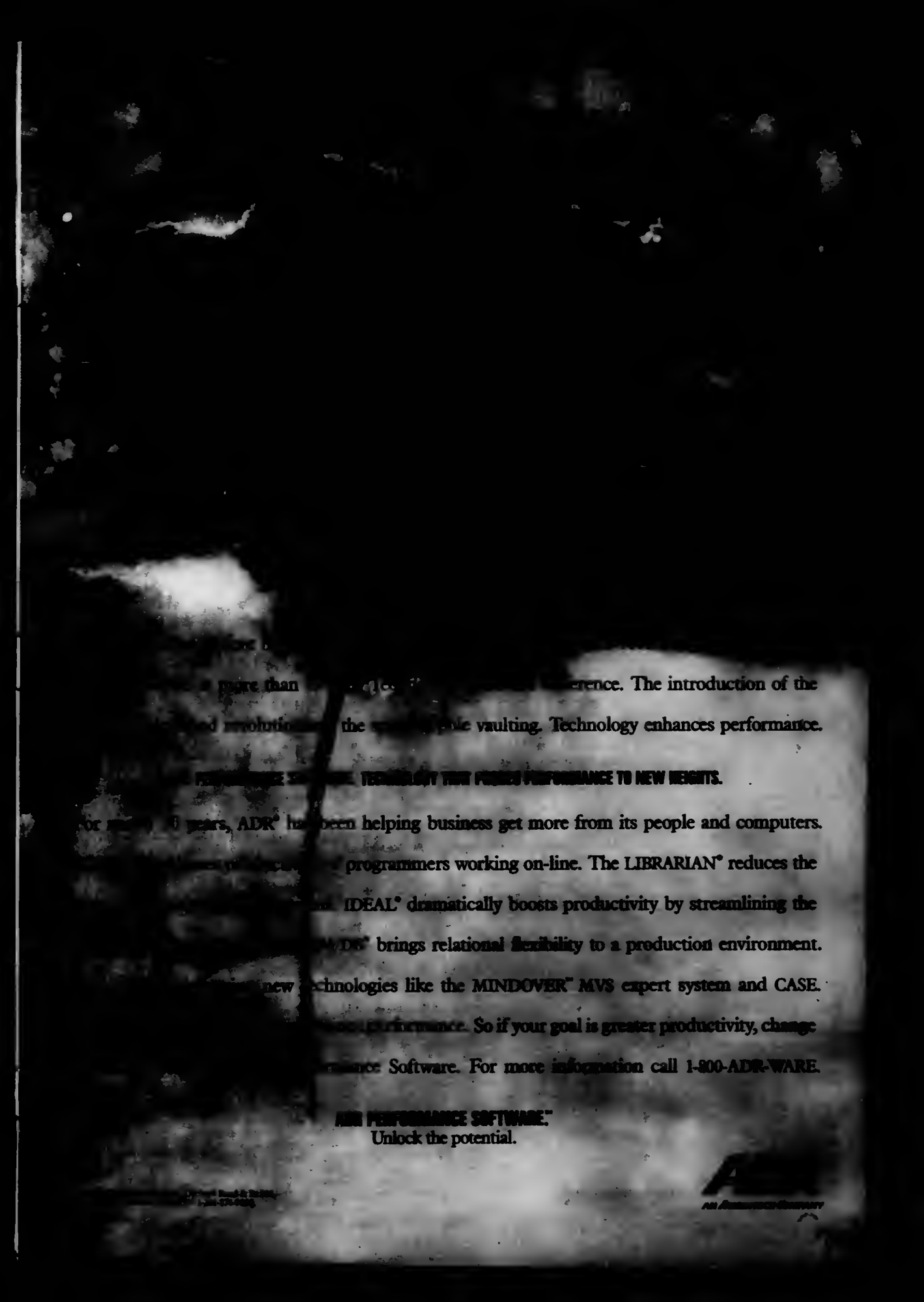
IBM doled out the packages of beta code for OS/2 Extended Edition 1.0 to developers who attended a recent OS/2 seminar in San Francisco. The $2,200 attendance fee also bought developers access to later releases of source code for OS/2 Standard Edition 1.1 with the Presentation Manager, OS/2 Extended Edition 1.1 with local-area network support and the LAN Server.

Developers that received the development kits, such as Borland International and Oracle Corp., declined to comment on the condition of the code until they had more time to put it through a series of checks and test procedures.

IBM said it plans to hold similar seminars in Dallas and New York in May to drum up support for the new operating system and win commitments from developers for next-generation applications.

The first kit to reach developers included source code for OS/2 Extended Edition 1.0, which contains a relational data base manager and a communications manager that provides intersystems communications and terminal emulation. The kit also contained documentation on OS/2 Extended Edition and pointers on understanding IBM's SQL.

According to documents given to developers, IBM is loaning the beta code to third parties for up to two months after the first commercial shipment of each OS/2 version. OS/2 Extended Edition is scheduled to be released in July.


more than
rence. The introduction of the
the
vaulting. Technology enhances performance.
TECHNOLOGY THAT PUSHES PERFORMANCE TO NEW HEIGHTS.
For
years, ADR® has been helping business get more from its people and computers.
programmers working on-line. The LIBRARIAN® reduces the
IDEAL® dramatically boosts productivity by streamlining the
DB® brings relational flexibility to a production environment.
new technologies like the MINDOVER™ MVS expert system and CASE.
performance. So if your goal is greater productivity, change
Software. For more information call 1-800-ADR-WARE.
ADR PERFORMANCE SOFTWARE.™
Unlock the potential.

PC compatibles still thriving

BY ALAN J. RYAN
CW STAFF

Quarterly results reported last week by Compaq Computer Corp. and AST Research, Inc. indicate that the IBM Personal Computer-compatible market is still thriving despite IBM's Personal System/2.

According to analysts, many companies continue to buy into the IBM PC AT-style bus architecture, which IBM has discontinued in favor of its Micro Channel architecture. However, some say the days of the AT bus may be numbered.

"IBM is selling futures with the Micro Channel," said analyst David Wu at S. G. Warburg & Co., "but it doesn't do users any good today."

'Interest will shift'

But according to John Rossi, a microcomputer and peripherals analyst at Alex Brown & Sons, Inc. in San Francisco, bus confusion will begin to take its toll during the summer months. "Consumer interest will start to shift to PS/2s and compatibles, even though there will still be a price-sensitive market for AT compatibles," he said.

Rossi said that although there will not be a rapid transition to the Micro Channel, buyers anticipating it will reduce the number of AT-style computers they purchase.

For now, at least, the non-Micro Channel vendors are faring well.

Compaq recorded sales of $439 million in the first quarter of this year — more than twice the sales of $211 million in the first quarter of 1987. Earnings equaled $47 million, or $1.21 per share, which is a 132% increase from last year's same-quarter earnings of $20 million, or 56 cents per share.

Alex Brown's Rossi said that the Compaq earnings were quite solid, but the higher cost of dynamic random-access memory, the reduced pricing of computers based on Intel Corp.'s 80286 microprocessor and higher overhead costs are chipping away at Compaq's gross margin.

At AST, quarterly results were quite favorable as well. The company reported worldwide sales of $105.8 million for its fiscal third quarter, an increase of 91% over the $55.4 million recorded in the comparable 1987 period. AST earnings for the period rose to $5.2 million, or 45 cents per share, compared with $3.3 million, or 29 cents per share, earned during the third quarter of fiscal 1987.

Compaq President and Chief Executive Officer Rod Canion said the rise in sales was attributable to the acceptance of the Compaq Deskpro 386/20 and the growth of Compaq in international markets.

Micro Channel

FROM PAGE 1

forces during the last year to reach corporate customers.

"In the case of both Tandy and Dell, you have two companies that have not been positioned head-to-head with IBM in corporate accounts," said Peter Teige, an analyst at Dataquest, Inc. "Just having a Micro Channel machine won't make them a threat to IBM, but it moves them in the right direction."

Remains to be seen

But just how IBM-compatible Tandy's and Dell's new systems are is uncertain. "I don't think anyone will have an idea of how compatible they are until they are released for independent testing," Teige said.

Fort Worth-based Tandy will be the first of the two companies to ship a PS/2-compatible system; volume deliveries are scheduled for July. Tandy's Tandy 5000 MC, based on the Intel Corp. 80386, will be marketed through the firm's 365 Radio Shack Computer Centers, its direct sales force and 200 independent value-added dealers. Tandy may later introduce an Intel 80286-based Micro Channel-compatible system, officials said.

Dell's 80286 system, based on a Micro Channel-compatible chip set supplied by Chips and Technologies, Inc., and its 80386 PS/2 clone, based on a chip set said to be supplied by Intel, are scheduled to follow in the fourth quarter. Pricing is estimated at 30% higher than comparable micros with an IBM Personal Computer AT bus architecture. Actual shipment dates for Dell's two PS/2 compatibles will not be announced until August.

Tandy officials said they believe prior arrangements with IBM protect Tandy from any patent infringement litigation regarding IBM's proprietary Micro Channel architecture.

The first wave

Tandy and Dell Computer are first to formally announce personal computers compatible with IBM's Micro Channel architecture

	Intel processor	Memory options (in bytes)	Available drive options (in bytes)	Availability	Price
Dell System 400	80286	1M to 16M	40M, 80M, 150M	Fourth-quarter	NA*
IBM Personal System/2 Model 60	80286	1M to 15M	44M, 70M	Current	$5,295 to $6,295
Dell System 500	80386	2M to 16M	40M, 90M, 150M, 322M, 610M	Fourth-quarter	NA
Tandy 5000 MC	80386	2M to 16M	40M, 84M	June or July	$4,999 to $6,999
IBM PS/2 Model 80	80386	1M to 16M	44M, 70M, 115M, 314M	Current	$6,995 to $13,995

* Not available

CW CHART

Regarding the patent issue, Dr. John Patterson, Tandy's senior vice-president, delivered the following prepared statement: "The product we are announcing today is covered by our existing patent license agreement with IBM. IBM has informed us that PS/2 patents to be issued to IBM in the future are not licensed and will be the subject of future license negotiations." The company declined to further explain its licensing agreements with IBM. Tandy Chairman John Roach said, "Our statement is clear. We're not aware of any grounds for any challenge, but I can't speak for IBM."

Dell Chairman and Chief Executive Michael Dell said his company is currently negotiating a licensing agreement with IBM and hopes to reach a final pact in several weeks. He declined to elaborate further.

Dell said his company will not actively promote the new systems. "There are some corporate customers leaning in the direction of Micro Channel in the long-term, but in the short term, they want to buy the AT bus," he maintained, estimating that 20% of the company's sales next year will be Micro Channel-based systems. "Conceptually, Micro Channel could offer faster data transfer rates and processing speeds, but IBM's PS/2 offers significantly higher prices and lower performance when compared to the current industry standard."

In contrast to his earlier statements that there is no demonstrated demand for Micro Channel-based microcomputers, Tandy's Roach said customer reaction to its PS/2 compatible has been positive.

Dataquest's Teige said the Micro Channel will become the industry standard, although current demand for PS/2s is "not overwhelming.

"IBM has already shipped about one million Micro Channel units," he said. "It's inevitable that it will become the standard. But it will take a while for hardware and software to come together to exploit its advantages."

IBM claims to have shipped more than two million PS/2s, not all of which contain the Micro Channel.

Bouldin wins CDLA top spot

PALM DESERT, Calif. — Kenneth A. Bouldin, chairman of Econocom-USA, Inc., was named president of the Computer Dealers & Lessors Association (CDLA) Friday after unanimous election by the board of directors at the association's spring meeting here.

Bouldin, who will resign his Econocom position, fills the vacancy created by James F. Benton's death last month. Benton, CDLA's first executive director and later president, suffered a fatal heart attack March 6.

The appointment is effective June 1. Bouldin founded Memphis-based Econocom 17 years ago and has long been active in CDLA affairs and lobbying efforts. He is currently one of five CDLA vice-presidents and is a past recipient of the association's prestigious John Oliver Executive of the Year award.

Bouldin will maintain his Memphis residence but will spend several days a week at CDLA headquarters in Washington, D.C., CDLA Chairman Robert Gulko said. Econocom, the U.S. subsidiary of Amsterdam-based Econocom International N.V., is one of the largest lessors and brokers of IBM mid-range computers.

CLINTON WILDER

COMPUTERWORLD

Editor in Chief
Bill Laberis
Executive Editor
Paul Gillin

News Editor
Peter Bochelli

Senior Editors
James Connolly, Management
Clinton Wilder, Industry
Elizabeth Horwitt, Networking
Charles Babcock, Software
Patricia Keefe, Networking
Ed Scannell, Microcomputing
Douglas Barney, Microcomputing
Stanley Gibson, Systems

Senior Writers
Rosemary Hamilton
Neil Margolis
Alan J. Ryan

Staff Writer
James Daly

New Products Writer
Sally Cusack

Features Editor
George Harrar

Senior Editors
Gina Ribin
Janet Fiderio, Executive Report
Joanne Kelleher, Spotlight
Amy Sommerfield Fiore, In Depth

Special Projects Editor
Michael L. Sullivan-Trainor

Senior Writer
David A. Ludlum

Associate Editors
Deborah Picking
Kelly Shea

Researcher
Bonnie MacKell

Managing Editor
Deanwen White

Chief Copy Editor
Patricia Neal Erickson

Assistant Chief Copy Editor
Steven M. Ulfelder

Copy Editors
Mary Grover
Martha E. Rueh
Sharon Baker
Marie T. Burke
Cathleen A. Duffy
Richard R. Peters

Design Editor
Marjorie Magovern

Graphics Specialists
Frank C. O'Connell
Amy J. Swanson

Graphics Researcher
Laura O'Connell

Graphic Designer
P. Charles Lukaszczyk

Assistant to the Editor in Chief
Theresa Gallant

Editorial Assistants
Patricia Faherty
Linda Gorgone
Lorraine Witzell

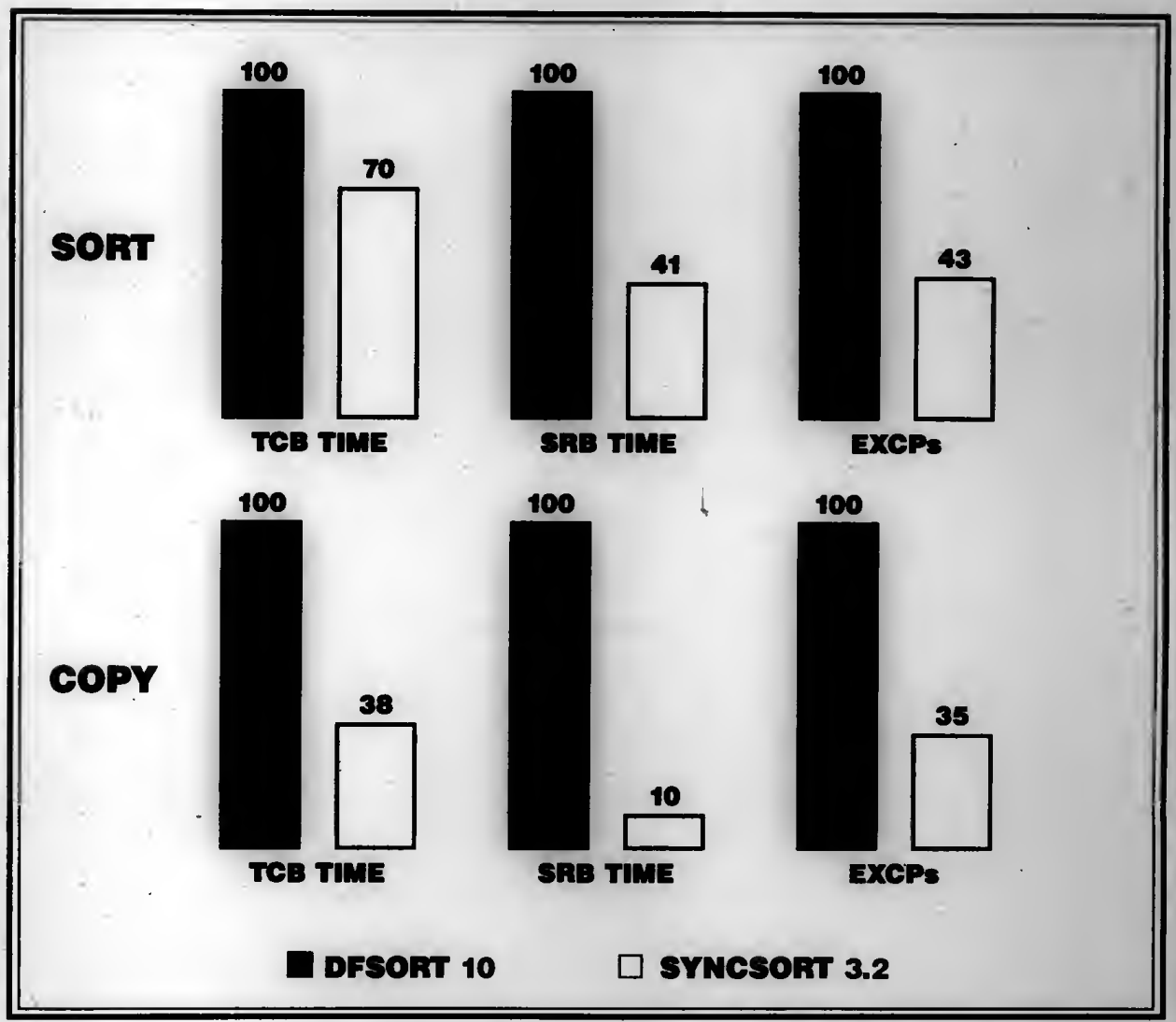
Rights and Permissions Manager
Nancy Shannon

News Bureaus
Mid-Atlantic
201/967-1350
Alan Alper, Correspondent
Washington, D.C.
202/347-6718
Mitch Betts, Correspondent
West Coast
415/347-0555
Kathy Chin Leung, Bureau Chief
Julie Pitta, Senior Correspondent
James A. Martin, Correspondent
Stephen Jones, Correspondent
J.A. Savage, Correspondent
Mary Elliott, Editorial Assistant
Midwest
312/827-4433
Jean S. Bozman, Correspondent

IDG News Service
Kathleen A. Gow, Director

Main Editorial Office
Box 9171, 375 Cochituate Road
Framingham, MA 01701-9171
617/879-0700

SYNCSORT 3.2
vs.
DFSORT 10



Spring '88

It happens every year.

Experience this performance on your own system with your own benchmark.

To arrange for a benchmark of SyncSort's **New Release (3.2)** on your system, call us at **(201) 930-8200.**

syncsort INC.

THE BEST OF SORTS.™

© 1988 Syncsort Incorporated, 50 Tice Boulevard, Woodcliff Lake, NJ 07675.

VAX sets sail on symmetrical

Calypso out; Olsen promises OLTP to 'pesty' banks, insurance firms

BY STANLEY GIBSON
and NELL MARGOLIS
CW STAFF

Digital Equipment Corp. brought symmetrical multiprocessing to the heart of its VAX line last week, announcing the widely anticipated VAX 6200 series and VMS Version 5.0.

The series, code-named Calypso, consists of one to four Microvax 3000 CPUs. The VMS version and 6200 series are available immediately.

Although DEC's introduction of symmetrical multiprocessing is viewed as boosting the performance of its on-line transaction processor (OLTP) VAX line, DEC chose not to make another much-anticipated announcement that included OLTP facilities.

Get off my back

"We are soon to make a major announcement in transaction processing," DEC President and Chief Executive Officer Ken Olsen said. "We are making major investments [in OLTP] because banks and insurance companies have been putting tremendous pressure on us to do so. They have been pests."

The VAX 6200 systems overlap several VAX 8000 series systems, which DEC said it will continue to offer. However, DEC lowered the price of the VAX 8550, which now sells for $351,000 to $453,000, depending on the configuration and operating system used.

Prices for typical configurations had previously been more than $500,000.

Key to unleashing the power of Calypso is VMS Version 5.0, which allows the processors to perform symmetrical multiprocessing, share memory and make a common copy of the operating system.

"The big news is that [VMS 5.0] establishes a structure into which DEC can just drop increased performance," said Bob Randolph, director of DEC advisory services at International Data Corp. in Framingham, Mass. "The theoretical limit is much higher than four processors. There are no major restrictions — the only question is the capacity of the bus."

Calypso systems use a 100M byte/sec. internal bus, a faster data path than the 60M byte/sec. bus used in the larger 8800 symmetrical multiprocessing family announced in March. William Demmer, vice-president of mid-range systems at DEC, acknowledged that the 100M byte/sec. path is designed to support more processors than the four currently supported.

He said the reason it was not used on the 8800 series was that to do so would have meant completely overhauling the VAX 8700 processors used in the system. Future growth for the 8800 line will come in a redesigned system, containing a faster bus and more processors, Demmer said. Such a system is "a year or more away," he added.

More nodes

VMS 5.0 increases the nodes that can be in a Vaxcluster and will allow the grouping of Ethernet-based local-area Vaxclusters and Vaxclusters based on the Computer Interconnect (CI) bus.

Up to 42 systems can be clustered on a local-area Vaxcluster or in a combined CI-based and local-area cluster, said Harriet Cohen, VMS product manager at DEC. The previous maximum was 26, she said. A solely CI-based cluster remains limited to a maximum of 16 nodes.

In addition to the VAX 6200 line and VMS Version 5.0, DEC introduced a new version of its Fortran compiler. The compiler, tailored to run on either single- or multiprocessor systems, will bring parallel processing to the VAX line for the first time.

Another dimension

DEC's VAX 6200 series, built around CMOS processors, spans a performance range currently covered by mid-range VAX 8000 models

6210	One	2.8	32M to 256M bytes	$170,500
6220	Two	5.5	64M to 256M bytes	$293,400
6230	Three	8.3	64M to 256M bytes	$386,800
6240	Four	11	128M to 256M bytes	$537,400

* Millions of instructions per second, based on CW estimates

INFORMATION PROVIDED BY DIGITAL EQUIPMENT CORP.
CW CHART

VMS loaded for control

BY NELL MARGOLIS
CW STAFF

VMS Version 5.0 will be remembered for bringing symmetrical multiprocessing to the VAX line. But the new version of Digital Equipment Corp.'s proprietary operating system also includes "about 20 to 30 things that VMS bigots are just going to love to get their hands on," said John Dean, a DEC analyst at Montgomery Securities in San Francisco.

Prominent among these features are improved system management facilities that centralize Vaxcluster management and let a system manager register, track and control software licenses.

Users will also be able to issue commands to any number of VAXs in a cluster rather than just one.

Around the world

Also included in the announcement is a suite of "internationalization" features that allow for easier worldwide dissemination of VAX-based applications. A utility built into the operating system software allows VMS 5.0 to handle programs and messages written in characters other than English.

Under a new clusterwide licensing option — effectively a price cut — large Vaxcluster customers can save 60% to 70% on VAX licenses, according to a DEC spokesman.

Formerly, each computer in a cluster required its own license. That pricing structure tended to become prohibitive for users as clusters grew in size, said Nick Pappas, software licensing and pricing manager at DEC.

One cluster, one license

A second new license option was designed to allow cost-effective occasional use of interactive software — the Datatrieve query facility, for example — on large VAXs and Vaxclusters, Pappas said.

With the User/Activity option, a four-user software license is available at a price independent of the processor; up to four more users can be added at no additional charge.

In addition, VMS 5.0 will be sold with Microvaxes as well as with other VAX systems; until now, the company recommended MicroVMS with the smaller system, according to Harriet Cohen, a VMS product manager at DEC.

DEC said VMS 5.0 will be out for the first time in compact disk/read-only memory format this summer, at prices starting at $910.

Refreshed CDC focuses on clustering, transparency

BY ALAN ALPER
and STANLEY GIBSON
CW STAFF

Control Data Corp. last week continued to renew its line of Cyber processors by adding six Cyber 960 models, positioned as mid-range mainframes between the 990 series at the high end and the 930 series at the low end.

The air-cooled systems, which are capable of performing 8.9 to 26.7 million instructions per second (MIPS), replace the water-cooled Cyber 860.

The company also announced that the next release of its proprietary operating system, NOS/VE Release 1.3.1, will be available within the next month and will enable customers to cluster as many as eight NOS/VE-based Cyber systems. The clustering feature will allow transparent file access among clustered systems, CDC officials claimed.

CDC also set forth a strategic direction, called the transparent computing environment, in which it plans to tie together the processors of different vendors, offering standard user interfaces.

Hospital stay

The introductions cap a hectic 18-month effort in which CDC replaced its entire Cyber line, unveiled new supercomputers from its ETA Systems, Inc. subsidiary and committed to a strategic relationship with technical workstation vendor Silicon Graphics, in which it purchased a 20% equity interest.

"Two years ago the patient, meaning us, was on the operating table, bleeding profusely. But the hemorrhaging has stopped," said Gil Williams, CDC computer systems vice-president, describing the corporate turnaround symbolized by replacing the Cyber line.

Three of the new Cyber 960 models run NOS/VE, while the other three, offered at the same performance levels, run both NOS and NOS/VE. The three running only NOS/VE are the single-processor 962-11, capable of 8.9 MIPS; the single-processor 962-31, which can perform 14.8 MIPS; and the dual-processor 962-32, which can perform 26.7 MIPS, according to CDC.

The three models running both NOS and NOS/VE are the 960-11, the 960-31 and the 960-32. All models are scheduled to be available in the third quarter. The dual-processor models 962-32 and 960-32 offer symmetrical multiprocessing.

CDC said a Unix-based operating system will be available for the 962 models and for its Cyber 930 series of departmental processors in late 1989.

The 962-11, with 32M bytes of memory, carries a base price tag of $533,500; the 962-31, with 64M bytes of memory, starts at a price of $951,750; and the 962-32, also with 64M bytes of memory, is priced from $1.6 million.

The 960-11 begins at $705,000, the 960-31 is priced at $1.06 million and the 960-32 starts at $1.7 million.

Bad old days

Compared with equivalent products from DEC (the VAX 8700 and 8800) and IBM (low-end 3090 machines), the Cyber machines offer a 10% to 15% lower price and a 50% increase in raw performance, according to Williams. The processors operate at a clock speed of 11 nsec, he added.

Williams attacked DEC's VAX architecture as "embedded in the 1960s" and IBM's computing approach as splintered among a variety of architectures and operating systems.

He noted that while DEC has recently delivered symmetrical multiprocessing, CDC has offered it on the Cyber line since 1967.

CDC's transparent computing environment will include CDC's Desktop/VE, which provides a seamless interface from a Macintosh environment to a Cyber system.

CDCnet, another component of the transparent computing environment, is the company's distributed architecture and supports both Ethernet and Transmission Control Protocol/Internet Protocol.

The goal of the transparent computing environment, to which CDC says it plans to add enhancements, is to give users access to any corporate computing resource.

"They won't need to know where the processing is taking place," Williams claimed.

Allen takes AT&T helm after Olson's death

BY ALAN ALPER
CW STAFF

NEW YORK — AT&T's board of directors last week formally appointed Robert E. Allen chairman and chief executive officer, succeeding James E. Olson, who died of cancer last Monday.

Allen, who was named president and chief operating officer 20 months ago, had been running the company since Olson became ill last month. The board did not name a president to succeed Allen.

A career AT&T employee, Allen is expected to closely adhere to his predecessor's strategy of focusing on the long-distance telephone business and expanding the company's reach in international telecommunications. He is also expected to continue bolstering AT&T's presence in the computer industry by emphasizing its strengths in networking technology and the Unix operating system, while building on a recently established alliance with Sun Microsystems, Inc.

"I fully intend to continue leading AT&T on the course Jim set out for us," Allen said in a prepared statement. "The other officers and I concurred [with] the basic strategies Jim laid out in 1986, and they are no less worthy today than they were at that time."

Cost-cutting inheritance

Allen also inherits Olson's stringent cost-reduction program, which has returned luster to the company's balance sheet but cost about 27,000 AT&T employees their jobs.

"Olson set in motion the operations consolidation phase," said Fritz Ringling, an analyst with Booz Allen & Hamilton, Inc. "That process will take another couple of years to complete."

That cost-cutting strategy has enabled the company to bolster profits, despite relatively stagnant revenue growth. In conjunction with AT&T's shareholders meeting last Wednesday, the company announced first-quarter profits of $492 million, an 11% increase from $445 million a year before. Revenue increased only 2.8% in the year-to-year comparison, rising from $8.12 billion to $8.35 billion.

Some observers considered Olson, who became chairman at age 60, an interim leader. But they said they expect Allen, 53, to leave a legacy at the telecommunications behemoth by the time he reaches 65, the mandatory retirement age.

"He's a capable manager," noted Bart Stuck, an analyst at Probe Research, Inc. "He'll be good at exploiting the strategy that Olson started."

Yet other analysts contended that like Olson, Allen will avoid making many of the tough decisions the company needs for full recovery. Olson deferred deciding such questions as whether to approve private information networks and whether to acquire a computer-industry company or withdraw from the business, these analysts pointed out.

One of Allen's first tasks is to select a second-in-command. Many observers believe AT&T needs an executive with a strong marketing background to help fuel growth, particularly within its Data Systems Group. Others say the company needs an executive with an eye for strategic acquisitions.

The leading presidential candidates come from the office of the chairman. Besides Allen, that office includes vice-chairmen Charles Marshall, 58; Morris Tanenbaum, 59; and Randall Tobias, 48.

Some analysts consider Tobias, who heads AT&T's long-distance and computer marketing businesses, Allen's first choice.

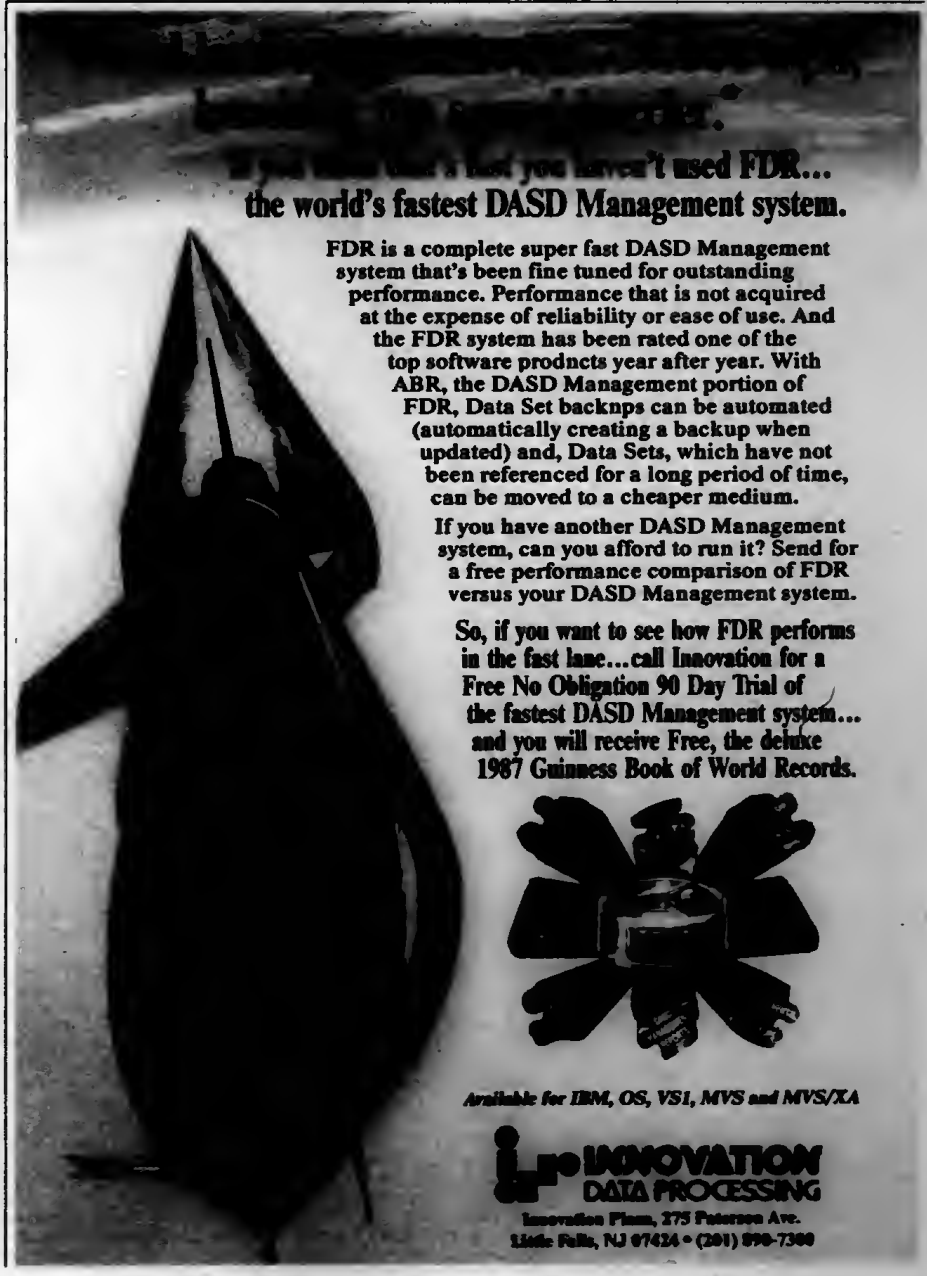
Chairman and CEO Allen

Allen joined AT&T in 1957 after graduating from Wabash College; he followed the prototypical Bell system executive fast track. He served in a variety of management capacities before becoming vice-president of Bell of Pennsylvania in 1974.

From 1976 to 1978 Allen was chief operating officer at Illinois Bell, the divested Bell operating company that AT&T had used to groom up-and-coming executives. In 1981, he was elected president of the Chesapeake and Potomac Telephone Co.

Just before AT&T's divestiture of its regional operating companies in January 1984, Allen was asked to be president of Bell Atlantic Corp. He opted instead to serve as AT&T executive vice-president and chief financial officer.

Olson, who presided over AT&T for 20 months, will be remembered as an energetic, no-nonsense CEO who restored order to the telecommunications giant after years of disarray. He was an operations specialist who prided himself on having worked his way up from the position of splicer's assistant and who claimed never to have lost touch with lower level employees.



Users, vendors snub ONA plans

Bells' proposals seen as 'confusing hodgepodge of bundled services'

BY MITCH BETTS
CW STAFF

WASHINGTON, D.C. — The Open Network Architecture (ONA) plans of the regional Bell holding companies got a scathing critique last week from network users groups and vendors. They called the ONA plans a confusing hodgepodge of bundled services.

The proposals, totaling some 7,000 pages, "are a waste of good trees," said the ONA Users Group, a coalition that includes the Association of Data Communications Users and other business network associations.

ONA is the Federal Communications Commission program that allows the Bell companies to offer enhanced network services, unfettered by separate subsidiaries, if they give competitors equal access to unbundled elements of their networks (CW, Feb. 1).

The main objections were the charge that the Bell companies failed to honor the FCC's requirement for unbundling of basic service elements and that the seven regional plans showed virtually no national uniformity.

The ONA plans, filed in February and subject to FCC approval, "offer some new bells and whistles but cannot be fairly described as opening the public network itself," the ONA Users Group concluded.

The harsh criticism came not only from users groups but also from value-added network vendors such as Telenet Communications Corp.; Tymnet, McDonnell Douglas Network Systems Co.; and ADAPSO, a trade association for computer services companies. The critics urged the FCC to require the Bell companies to draw up new ONA plans.

Freedom of choice

The users and network vendors had hoped ONA would allow them to pick and choose the basic service elements to buy from the Bell operating companies once transport and switching functions were unbundled.

However, the Bell companies' ONA plans combine basic service elements into packages called Basic Serving Arrangements (BSA). The regional Bell holding companies argued that these BSAs are fundamental connections and cannot be further unbundled. Southwestern Bell Corp. called a BSA "the barest possible fundamental interconnection to the network."

With the exception of Nynex Corp.'s plan, the ONA plans generally offer features attractive to the voice side of the industry, such as telephone answering services. However, Nynex will offer an interoffice data-over-voice service that is valuable to large data users, the ONA Users Group said.

Users had requested four types of ONA services:

- Access to the Bell companies' operations-support systems for diagnostic and traffic information.
- Calling-number identification, which would help identify dial-up hackers who break into computer systems.
- Derived local-loop channels to transport voice and data simultaneously.
- Gateways to foster information and banking services.

But a study by John G. Williams, vice-president of the Telecommunications Consulting Group, Inc. in Washington, said the Bell companies tended to declare these functions "beyond the scope of ONA."

Williams' report said that only Ameritech and Nynex are working on customer access to their operations support systems. Nynex will implement a data-over-voice service, and Bell South Corp. may do so, but the others have no plans for such a service and may be waiting for full-scale implementation of Integrated Services Digital Network (ISDN), the study said.

Keeping pace

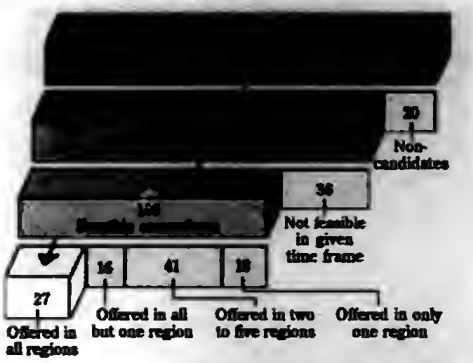
Data-over-voice technology would meet current demands for simultaneous transmission of voice and data in advance of ISDN and would avoid the inconvenience of blocked voice calls and the expensive alternative of a second loop dedicated to data, the Williams report said.

The regional Bell holding companies arrived at their ONA plans by whittling down a list of 158 service requests from enhanced service providers and users. According to a study by Hatfield Associates, Inc., a Boulder, Colo.-based consulting firm, the process yielded only 27 services to be deployed in all seven regions next year. About 75 other services will be offered in some, but not all, regions.

"The mixed availability seems particularly curious, since by and large, all Bell operating companies use the same basic switching technology and a similar transport architecture," the Hatfield study said.

Network wish lists

Of 158 requests for Open Network Architecture basic services received by regional Bell holding companies, only 27 are considered feasible to be offered in all seven regions by September 1989



INFORMATION PROVIDED BY HATFIELD ASSOCIATES, INC.
CW CHART

MSA narrows its focus, heads back home to IBM

BY ROSEMARY HAMILTON
CW STAFF

CHICAGO — While most mainframe software companies are loosening the IBM apron strings, Management Science America, Inc. (MSA) is going back home to the industry giant.

MSA users and industry analysts appear to applaud that strategy, although it defies the current trend, because they say MSA can be most successful at what it knows best.

At the annual Interact conference for MSA users, held here last week, company executives said MSA is shifting its development focus away from multiple hardware platforms, including Digital Equipment Corp. VAXs, and back to an IBM strategy.

In continuing its traditional business of mainframe applications, MSA has also decided to put its money on IBM's soon-to-be-announced mid-range offering, the System/36 and 38 follow-on, which is commonly called Silverlake.

The focus on IBM takes MSA back to its roots. For most of this decade, the company has attempted several new ventures. Some have bombed, such as a foray into personal computer software that ended in 1985. Others, including an effort to provide applications for Honeywell, Inc. and Unisys Corp. hardware, have been moderate successes. MSA continues to offer applications for those platforms, although the lines are not central to its business.

As recently as last year's users group meeting, MSA was promoting new ventures into the DEC market and plans to port its Information Expert, an interactive front end for its applications, to microcomputers and at least four minicomputer platforms. None of these plans have been scrapped, but they now fall well below IBM on the priority list, MSA executives said.

"The way they had been going was confusing, but now they are one single image again," said Gary Biddle, vice-president of MIS at American Standard, Inc. in New York.

This shift likely comes in response to 1987, which was a difficult year for MSA. While the company showed a 43% increase in revenue last year, it ended with a loss of $221,000. The loss was caused by a change in accounting procedures as well as the troublesome acquisition of RTS Ltd., which wound up costing the company more than it bargained for.

Shortly after the financial setback, MSA restructured, setting off a management exodus in the process. The recently formed manufacturing subsidiary was pulled in closer to the company, prompting the departure of Dennis Vohs, who had been with MSA for nearly two decades (see story page 25). There is now one executive, Michael Hunt, in charge of all research and development, and another, Douglas MacIntyre, in charge of all sales and marketing.

> "THE WAY they had been going was confusing, but now they are one single image again."
>
> GARY BIDDLE
> AMERICAN STANDARD, INC.

Previously, the manufacturing subsidiary, Advanced Manufacturing, Inc., had its own R&D and sales efforts. It remains a separate subsidiary but will function more as a division within MSA. The new organization was set up to address a series of vertical markets, including manufacturing, and to execute the plan to focus more intensely on the IBM platform.

Analysts said they see MSA returning to the IBM fold after taking unsuccessful shots at other opportunities. "For a number of years, they tried lots of new markets, and they found that to be painful," said Mark Dunkel, a first vice-president at Robinson Humphrey Co. in Atlanta. "They are not now contracting but focusing on what they've traditionally done well. They are a much more subdued MSA. They are not going to do anything drastic or risky."

The MSA presented to users at Interact was one closely aligned with IBM. Such an image contrasted with last year's meeting, at which executives discussed big plans for the DEC VAX market as well as other hardware platforms.

Last week, however, Hunt, who in addition to his R&D responsibilities serves as president of the manufacturing group, summed up the company's spending this way: "In allocating our dollars and knowing IBM's power, it's a higher priority to spend on IBM than DEC. We see our potential here and put more emphasis back on IBM."

"This is a lower growth strategy, but what they know best is IBM, and they'll be sticking to that for the near future," Robinson Humphrey's Dunkel said.

According to Hunt, it would not have been financially feasible to simultaneously port MSA's applications to the DEC platform and support the IBM Systems Application Architecture strategy and its new mid-range platform.

IBM expansion

Users said MSA plans to continue to improve its traditional applications and expand into the IBM mid-range platform, which fits with user needs.

"I've been associated with MSA for 14 years, and right now, I'm hearing a lot of positive things," said Toni Marie Everhart, a vice-president at The Arizona Bank in Phoenix. "They are acknowledging for us that distributed processing is here."

Robert Therrien, an analyst with Paine Webber, added, "What will happen is their growth rate will slow, but that doesn't mean they'll be a bad company. The most salient point to MSA is that their customers are very happy. Their products work, and that says a lot."

ORACLE, YOUR HARDWARE-INDEPENDENT SOFTWARE SOLUTION

With the ORACLE® distributed relational DBMS, you'll never be locked into a specific hardware technology.

In this year's Software User Survey,* one company made history in all three categories of DBMS user preference.

For minicomputers, Oracle is the number-one independent software vendor for the second year in a row. *Digital News*† ranks Oracle as the number-one overall software vendor in the entire DEC marketplace. So does The Gartner Group.‡

Oracle tied for mainframe honors with the former champion of independent software companies. In the MVS and VM world, ORACLE is second to no one.

And Oracle made the Top-5 list in the most competitive arena of all: microcomputers. This is especially significant, since the voting was done BEFORE the newest version of the ORACLE relational DBMS was announced for 286/386-based PCs.

Now you can write OS/2 applications without waiting for OS/2.

Mainframes, minis and micros — all running the same ORACLE. Not just compatible. Not downsized subsets. They all run the same ORACLE.

The market has voted for ORACLE, the hardware-independent software solution.

We've been saying SQL compatibility, portability across micros/minis/mainframes and SQL*Star's distributed architecture connectability make ORACLE a triple-crown winner in your company's DBMS strategy.

Now, the users are saying it, too. Don't settle for anything less than ORACLE hardware independence.

Find out what ORACLE could mean in your own future. Call 1-800-345-DBMS today and register to attend the next ORACLE seminar in your area. Or fill out the attached coupon.

ORACLE®

The Hardware-Independent Software Solution

Call 1-800-345-DBMS, ext. 105

One Oracle Parkway • Belmont, CA 94002 • World Headquarters (415) 506-5000
Calgary (403) 233-3022 • Ottawa (613) 238-5801 • Quebec (514) 337-9755
Toronto (416) 506-7780 • ORACLE Systems Australia 61-3-820-2500
ORACLE Europe 44-344-860111 • ORACLE Systems Hong Kong 852-5-268343

*1987 Software User Survey, publ. by Software News, © 1987 by Cowley Publ. Company, Inc.
†Digital News, December 7, 1987. ‡Gartner Group currently available research.
© 1987 by Oracle Corp. ORACLE® is a reg. trademark. SQL*Star is a trademark of Oracle Corp.
The other companies mentioned own respective registered trademarks. 7/88

U.S. SEMINARS

AK	Anchorage	Feb 08
AL	Birmingham	Mar 29
	Montgomery	Feb 17
	Little Rock	Apr 07
AZ	Phoenix	Feb 23, Mar 24, Apr 28
	Tucson	Feb 24, Apr 27
CA	Costa Mesa	Feb 11, Mar 08
	Los Angeles	Feb 10, Mar 10, Apr 12
	Newport Beach	Apr 14
	Oakland	Apr 29
	Ontario	Apr 07
	Sacramento	Apr 28
	San Diego	Feb 09, Mar 15, Apr 05
	San Francisco	Feb 11, Mar 29, Apr 19
	San Jose	Mar 08, Apr 26
	Santa Barbara	Apr 19
	Westlake Village	Feb 04
CO	Denver	Feb 04, Mar 10, Apr 28
	Colorado Springs	Apr 14
CT	Hartford	Mar 22
	New Haven	Apr 14
	Stamford	Apr 27
DE	Wilmington	Apr 12
FL	Jacksonville	Mar 08
	Miami	Apr 14
	Orlando	Apr 13
	Tampa	Apr 05
GA	Atlanta	Feb 16, Mar 22, Apr 19
	Honolulu	Feb 16
	Honolulu	Apr 05
IA	Des Moines	Apr 19
ID	Boise	Apr 06
IL	Chicago	Feb 16, Mar 22, Apr 21
	Springfield	Feb 16, Apr 06
IN	Indianapolis	Feb 16, Mar 24, Apr 12
KY	Lexington	Mar 08
	Louisville	Apr 14
LA	New Orleans	Feb 19, Apr 29
MA	Boston	Mar 08
	Springfield	Apr 12
MD	Baltimore	Apr 22
	Bethesda (Federal)	Feb 16, Mar 03, Apr 07
ME	Portland	Mar 10
MI	Detroit	Feb 08, Mar 08, Apr 05
	Grand Rapids	Apr 06
MN	Minneapolis	Feb 24, Mar 23, Apr 28
MO	Kansas City	Mar 29, Apr 21
	St. Louis	Feb 10, Mar 15, Apr 14
MS	Jackson	Apr 12
NC	Charlotte	Feb 16, Apr 06
	Raleigh	Mar 16
	Winston-Salem	Feb 10
NE	Omaha	Mar 31
NH	Merrimack	Mar 22
NJ	Iselin	Feb 10, Mar 10, Mar 31, Apr 21
	Princeton	Feb 24, Mar 22, Apr 19
NM	Albuquerque	Mar 22
NV	Las Vegas	Apr 21
NY	Albany	Feb 09, Mar 10
	Buffalo	Apr 12
	Long Island	Feb 17, Mar 16, Apr 12
	New York City	Mar 22, Apr 20
	Rochester	Mar 03, Apr 29
	Syracuse	Mar 06
OH	Akron	Mar 22
	Cincinnati	Feb 17, Mar 15
	Cleveland	Feb 04, Mar 15
	Columbus	Feb 03, Mar 15
OK	Oklahoma City	Mar 10
OR	Tulsa	Apr 14
PA	Portland	Mar 15
	Allentown	Mar 22
	Harrisburg	Mar 17
	Philadelphia	Feb 11, Mar 16, Apr 15
	Pittsburgh	Mar 22
	Scranton	Feb 29
	Valley Forge	Feb 16, Mar 16, Apr 21
SC	Charleston	Mar 08
	Columbia	Apr 04
	Greenville	Apr 06
TN	Knoxville	Feb 03
	Memphis	Mar 02
	Nashville	Apr 05
TX	Austin	Apr 22
	Dallas	Feb 03, Mar 08, Apr 05
	El Paso	Mar 15
	Ft. Worth	Mar 22
	Houston	Feb 16, Mar 17, Apr 28
	San Antonio	Apr 21
UT	Salt Lake City	Mar 10, Apr 12
VA	Richmond	Mar 08
	Virginia Beach	Feb 11
VT	Burlington	Apr 05
WA	Seattle	Mar 05
	Spokane	Apr 12
WI	Madison	Feb 09, Apr 28
	Milwaukee	Mar 03, Apr 13

CANADIAN SEMINARS

To register for Canadian seminars, please call the office nearest you: Calgary 403-233-3022, Ottawa 613-238-5801, Quebec 514-337-9755, Toronto 416-506-7780.

Calgary	Apr 14
Edmonton	Feb 11
Halifax	Feb 17, Apr 21
Kingston	Feb 09, Apr 15
London	Feb 25, Apr 07
Montreal	Feb 24, Mar 22, Apr 27
Ottawa	Feb 04, Mar 03, Apr 07
Quebec	Feb 09, Mar 08, Apr 05
Regina	Apr 07
Saskatoon	Mar 10
Toronto	Feb 08, Mar 09, Apr 12
Vancouver	Mar 10
Victoria	Feb 25
Winnipeg	Feb 18

Attn: National Seminar Coordinator
Oracle Corporation • 20 Davis Drive
Belmont, California 94002

☐ My business card or letterhead is attached. Please enroll me in the *FREE* ORACLE seminar to be held

at: _____

on: _____

COMPUTERWORLD

Apollo cuts processor costs

BY NELL MARGOLIS
CW STAFF

CHELMSFORD, Mass. — Apollo Computer, Inc. last week slashed prices on its Series 4000 Personal Super Workstation line and reduced memory and disk prices on both the Series 4000 and Series 3000 Personal Workstations.

Although Apollo has enjoyed impressive success with its Series 4000 line, analysts said the company has saturated its installed base and is attempting to entice new customers.

With the entry price for the Series 4000 — including a 19-in. monochrome monitor and 4M bytes of main memory — cut 35% to $8,990, Apollo can hold out the offer of a 4 million instructions per second (MIPS) workstation for less than $9,000, an Apollo spokesman said. The color version is available starting at $13,990, representing a 26% price cut.

"It's a very aggressive price cut," the spokesman said. "The Series 4000 is already a best-selling entry in the mid-range workstation market; we want to maintain its price/performance advantage."

"These price cuts caught everybody by surprise," said Peter Schleider, an analyst at Minneapolis-based Wessels, Arnold & Henderson. The dramatic price change, he said, appears to be a Sun block. "The Sun [Microsystems, Inc.] 3/60 has a four-month backlog, so for the time being, people have to go elsewhere. Apollo is giving them someplace to go."

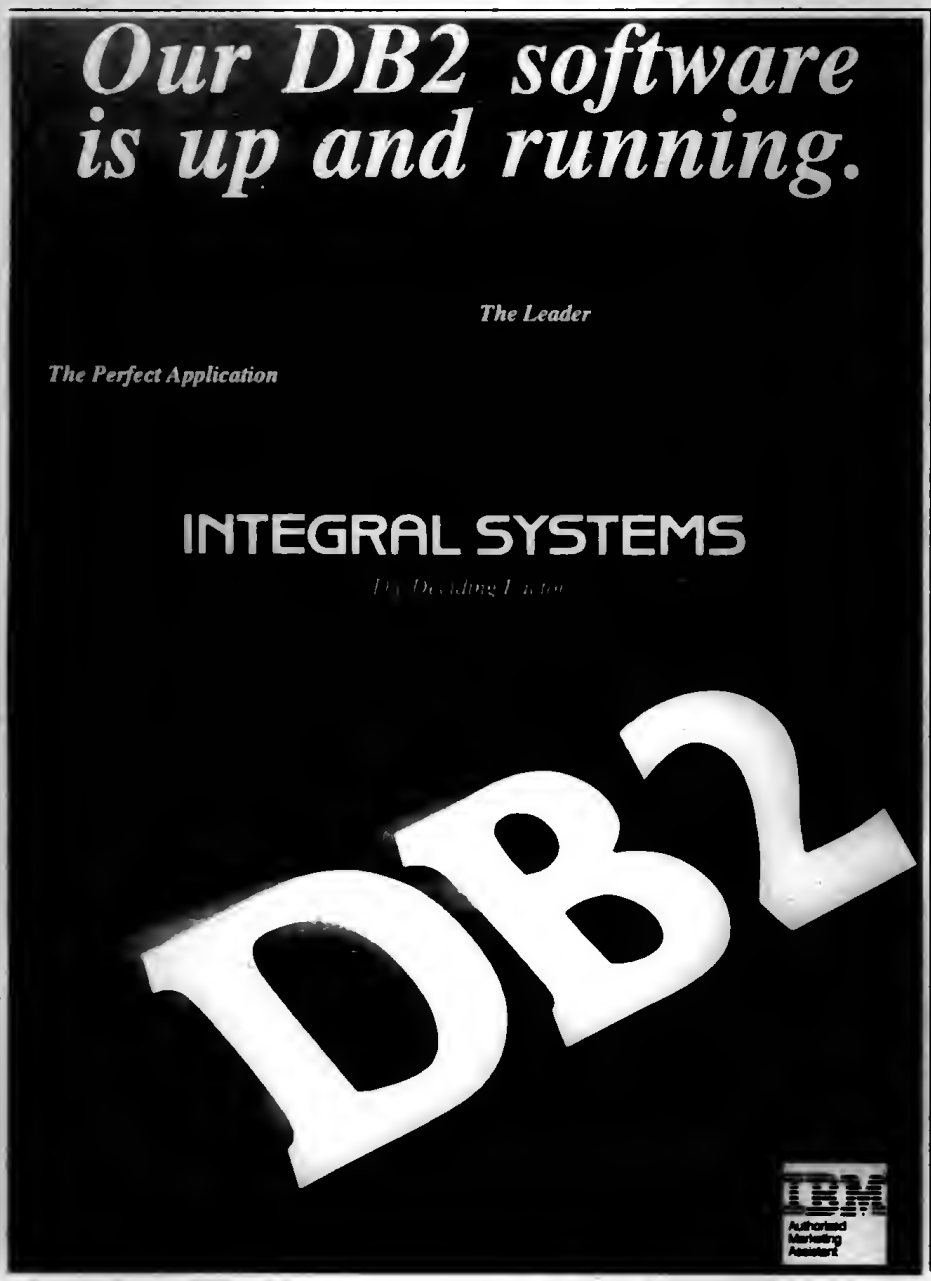
When the going gets tough. . .

"Apollo's first quarter was a blowout because of the 4000," Schleider added. But now, "they've milked their installed base; the easy sales are gone. Now they've got to hustle."

Robert G. Herwick, an analyst at Hambrecht & Quist, Inc., said that the Series 4000's performance was impeded somewhat by the small size of its cache memory. The Series 4000 has an 8K-byte virtual cache memory.

"Some benchmarks would rate it no higher than 2.5 MIPS," Herwick said. "This puts it at a disadvantage compared to the Sun 3/60, its most direct competitor." The dramatic price cuts, he added, cast the Series 4000 in a more favorable price/performance light.

Apollo also sliced prices by as much as 29% on a broad range of mass storage devices for the Series 4000 and 3000 workstations. Furthermore, the company announced an 18% price drop on Series 4000 memory prices and a correasponding 20% drop in memory prices for the Series 3000. It also added a floating-point accelerator that it said boosts Series 4000 processing speeds by up to 300%.



Firm revs up RISC chip set

BY STANLEY GIBSON
CW STAFF

Computer Consoles, Inc., riding a revival in its computer division sales, is scheduled to join today the parade of vendors promising Unix-based reduced instruction set computing (RISC) processors by announcing what it claims is the most powerful RISC-based chip set.

Designed for the Unix environment, the chip set will be capable of sustained performance of 25 million instructions per second (MIPS) and peak performance of 40 MIPS, Computer Consoles officials said last week.

The chip set will be included in a new series of minicomputers, called the CCI Power 7/64, that will be formally announced later this year, the company said.

Computer Consoles also said that in the first quarter of this year, it earned $3.2 million on sales of $39.2 million, up from profit of $833,000 on sales of $35.6 million in the year-earlier quarter.

The firm said its computer products division is currently breaking even — an improvement over its 1987 losses of $13 million. When John Cunningham, Computer Consoles' chairman and chief executive officer, took over the firm in 1985 after leaving the president's post at Wang Laboratories, Inc., Computer Consoles was awash in a sea of red ink; it lost $42 million that year.

Cunningham said the planned systems will be able to run compiled code intended for Sun Microsystems, Inc.'s Scalable Processor Architecture (Sparc) unit at only 55% of its normal speed — still, he claimed, faster than any current version of the Sparc chip.

The chip set includes an instruction processor chip, a bus switch chip and interfaces to Texas Instruments, Inc.'s floating-point processors. The two chips in the set that were designed by Computer Consoles will be fabricated in CMOS by Performance Semiconductor in Sunnyvale, Calif. The chips are expected to have a cycle time of 20 nsec., according to Computer Consoles.

The CCI Power 7/64 systems will be source-code compatible with the existing CCI Power 6/32 systems. The 6/32 is resold by Unisys Corp. as its 7040 and 7050 and by International Computers Ltd. as the Clan 6 and Clan 7.

Software Engineering of America, helping over 6,000 MVS Data Centers Worldwide run more efficiently.

S.E.A.'s DATA CENTER OPTIMIZER software systems

Guarantees you Substantial and Immediate Savings in many of your most critical areas of Data Center Operations.

PDSFAST DRIVER

PDSUPDTE
FASTGENR

PRO 2

ODDS

SAVRS

TRMS

VCF L

VCF M

VCF D

FREE – NO OBLIGATION
FORTY-FIVE DAY TRIAL.

SEA

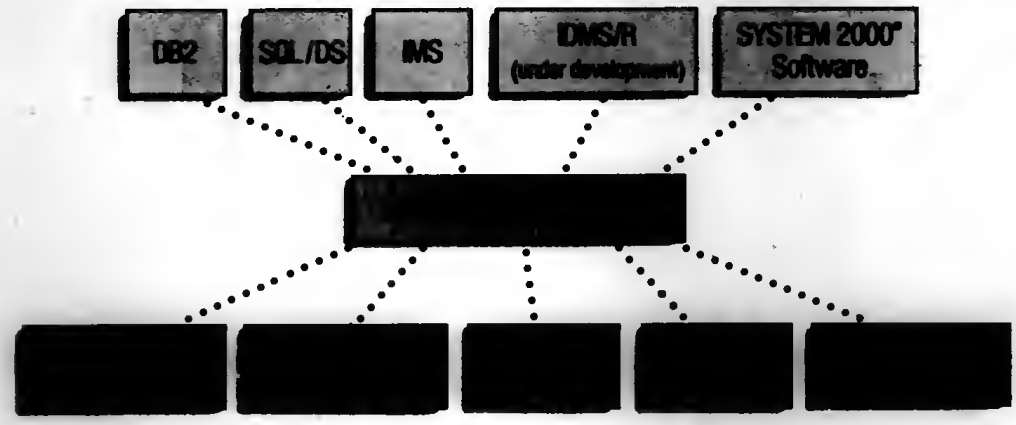
(516) 328-7000

Founded in 1982, Software Engineering of America, Inc. now has over 6,000 users worldwide. We attribute our success to two basic philosophies:

1. PRODUCTS YOU ASK FOR. Development and enhancement of products based on input from users, like yourself.

2. 24 HOUR RELIABILITY. An unfailing commitment to first rate technical support, 24 hours a day, 7 days a week.

Get the Facts from Your DBMS.



The most powerful applications software has joined forces with the most popular data base management systems. To turn raw data into meaningful facts. To analyze, estimate, optimize, simulate. To produce custom reports and color graphs. Whatever your information need, the SAS System delivers more from the data you store.

Don't Just Store Your Data. Explore Your Data.

The SAS System's ready-to-use tools uncover the real meaning of all those names and numbers. Forecast sales and cash flow. Perform statistical analyses. Build financial and planning models. Create spreadsheets of unlimited size. Schedule projects for best use of time and resources. Produce stacks of personalized letters. Generate calendars, charts, and many other formatted reports. Spot relationships and graph trends with powerful presentation graphics.

Or develop your own applications with the SAS System's efficient fourth-generation language. Customize these applications any way you wish.

If You Know Data Bases. And Even If You Don't.

who know nothing about data bases, have immediate access to the data they need. It's as easy as filling in the blanks!

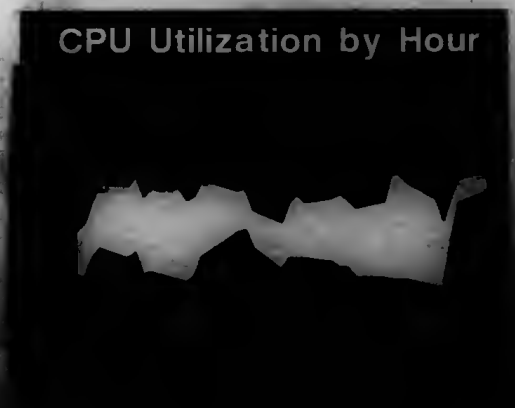
Extract data from your DBMS for use in SAS System applications. Load data from the SAS System directly into your DBMS.

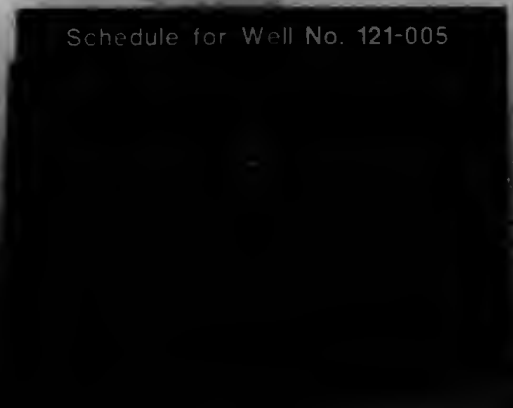
Update values in a data base directly from a SAS System application. All without risk to data security. The SAS System lets you choose which users browse or update specific files.

Get the Facts Today. And Get 30 Days FREE.

Bring the SAS System together with your data base. You'll receive high-quality software—plus training, documentation, and support—all from SAS Institute Inc. We'll even provide a free software trial to get started. For details, call or write today.

Get the SAS® System.





Time to take action, EDI users say

BY KATHY CHIN LEONG
CW STAFF

SAN FRANCISCO — Hal McDonald at 3M Corp. issued a challenge here last week: "You either change or get changed. EDI will be an absolute business necessity for 1990."

But McDonald, 3M's specialist for electronic data interchange (EDI), was preaching to the already converted. More than 1,000 users, vendors and consultants turned out for the ANSI X12 EDI conference, a first-time seminar that only 500 were expected to attend.

Momentum is building for the concept of electronic selling and trading with business partners. Nearly half the users at the show acknowledged they had solid EDI installations or pilot projects at their companies and were seeking to expand their implementations.

Furthermore, high-profile companies such as 3M, Union Carbide Corp., Eastman Kodak Co. and Levi Strauss & Co. are making EDI a corporatewide commitment. Recent findings from a Coopers & Lybrand joint study with EDI Strategies, Inc. in Marietta, Ga., showed that more than 5,000 domestic companies are current EDI users.

Be there or be square

EDI users, vendors and consultants addressed the conferees with a sense of urgency to adopt EDI, declaring that now is the time to prove to senior management that EDI will give their businesses a competitive edge. They warned that as more corporations become EDI users, they will force their suppliers and customers to comply.

"You can't implement if you are sitting out in the woods somewhere and thinking about EDI," McDonald said. "You have to act."

There is a wellspring of concern among pundits that the standard must be a priority. "This is not a technical issue," stressed Jack Shaw, president of EDI Strategies, during the conference's opening session. "This is a business issue."

The study by EDI Strategies and Coopers & Lybrand discovered that in the automotive, chemical, pharmaceutical and railroad industries, EDI is a requirement for present and future business partners.

"That is, you are at a severe competitive disadvantage if you are not already doing EDI," Shaw said.

The research, which included the responses of 600 companies, showed that by 1990, current EDI users will triple their number of electronic trading partners. And by 1990, it predicted, eight times as many companies will be using EDI, compared with 1987. In its own analysis, Service Merchandise, Inc. cut the price of a single purchase order transaction from $50 to $15 using EDI.

Bill Eaton, vice-president of information services at Levi Strauss, stressed that the elimination of paper invoices and purchase orders via EDI can reduce inventory overhead and ramp up the sales cycle.

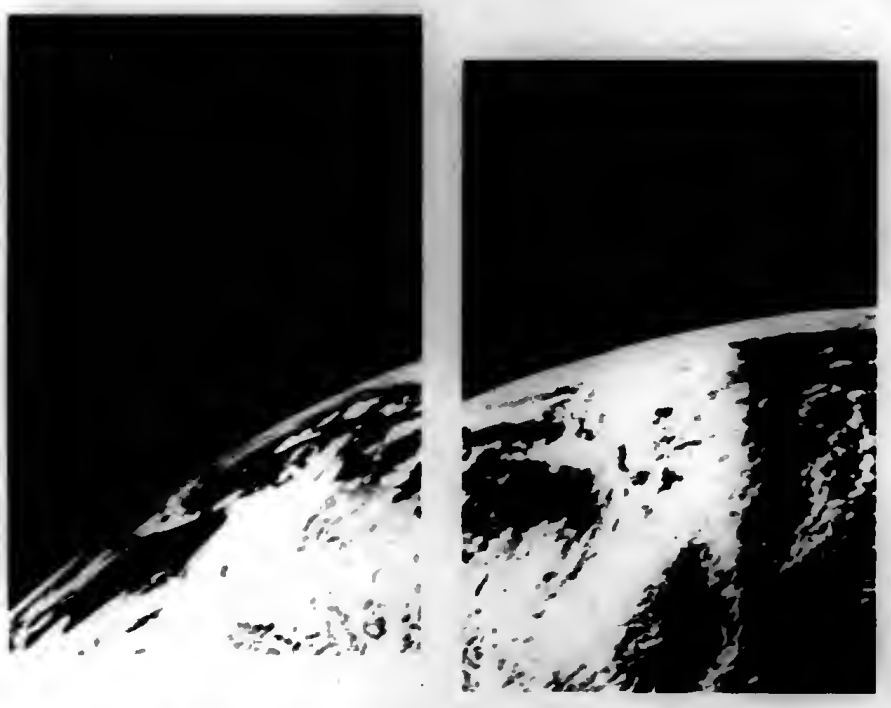
"For the textiles and garment industries, one day of shortened inventory is a savings of $96 million," he said.

Although start-up costs were high in the early 1980s, more vendors are addressing the market with new products and services, making entry into EDI easier than in the past.

For example, Control Data Corp. and Spectrum Concepts, Inc. in New York reached a pact to allow EDI users to transmit LU6.2 protocols on CDC's Rediner public data network when using the Spectrum Xcom 6.2 file transfer software.

In addition, Tandem Computers, Inc. announced an agreement with Transettlements, Inc. in Atlanta to jointly sell Translate, an EDI software package supporting Tandem Nonstop computers. According to the agreement, Transettlements will sell the software to Tandem users, giving them the ability to translate proprietary formats to industry-standard EDI formats.

For global business solutions,
The world turns



As the world's largest independent systems software company, Software AG is well positioned to provide the comprehensive, portable solutions that today's high-volume, multi-vendor computer environments demand. Software AG technologies form a family of more than 35 outstanding products, all integrated within ISA: The Open Integrated Software Architecture.™

Over the last 15 years, programmers and end users at more than 3,000 computer sites around the world have come to rely on the value of Software AG products. For these tens of thousands of users, *Software AG* has become synonymous with advanced information management technologies.

Today, new Software AG directions include:

- ADABAS 5, an information management technology that goes beyond Relational/SQL data management;
- NATURAL 2, with advanced 4th Generation functionality for applications development capabilities beyond COBOL;
- New offerings in the CASE arena, represented by our NATURAL Engineering Series; and
- A growing family of products for VAX users, with performance, functionality, portability, and integration beyond that of any other vendor.

3M turns EDI into way of life

BY KATHY CHIN LEONG
CW STAFF

Today, whenever any 3M Corp. vice-president discusses company direction, electronic data interchange (EDI) is always part of the conversation.

It has taken at least six years of spadework, but Hal McDonald, the firm's EDI specialist, is fully confident when he says, "3M is totally committed to EDI in our plans for the future."

At the ANSI X12 EDI conference in San Francisco last week, McDonald gave other users a peek at how a $9 billion international bureaucratic organization was able to turn the EDI concept into reality.

McDonald directs a 12-member EDI task force within the decentralized corporation. Early on, when he shared his vision with top managers, he admitted he was unable to prove dollar savings; nevertheless, he convinced them that EDI was a business necessity.

"I told them we couldn't afford not to go with EDI. In the 1990s, we might not have any business left, because we would get eaten for breakfast by our competitors," McDonald said.

Four years ago, 3M started a pilot project that involved three suppliers familiar with EDI. These days, the company employs the EDI services of three value-added network suppliers: GE Information Services, a division of General Electric Co., Control Data Corp. and McDonnnell Douglas Computer Systems Co.

The company works with 26 of its major suppliers using the X12 standard for electronic invoicing, purchase ordering and a handful of other transactions. Suppliers and 3M split the transmission costs for the network.

In the EDI arrangement, customers ordering from 3M will transmit requests through one of the value-added network suppliers. The supplier will then send the EDI order to the closest 3M branch, and that branch will hurry the order along to the central IBM mainframes at 3M's St. Paul, Minn., headquarters. The order is processed electronically to Hewlett-Packard Co.'s HP 3000 minicomputers at a 3M distribution site. The company uses EDI mainframe software from New York-based RJ York, Inc.

Part of the plan

The paperless method is already ingrained into 3M policy. Any of the 46 operating companies that wish to use another EDI vendor or write EDI software must get the approval of the EDI corporate review committee, McDonald said. Every quarter, 3M holds an internal user's group meeting to share EDI experiences and allow other divisions to implement similar EDI procedures.

Approximately 2% of all 3M's orders are processed using EDI, according to McDonald, who stressed that the percentage will definitely grow this year.

The cost for EDI is absorbed by the company's MIS budget for now, but McDonald said tentative 1989 plans call for each division to pay for the services.

"We are still examining the results," he said. "EDI is definitely saving us time and making everything more efficient. There are soft savings at this point, but the company is thoroughly convinced this is the way to go."

According to McDonald, the company does not force its suppliers to adhere to EDI but encourages them by saying they will be considered the company's "preferred vendors" if they start using it.

"You can't arm wrestle them into doing this," he said. "Many of our suppliers are our customers, so we don't want to lean too hard."

During the last five years, the company has invested less than $1 million in EDI efforts. So far, the reaction to the new way of doing business has been positive, McDonald said.

to Software AG.

And all of these technologies fit into the open, flexible structure of ISA, whose integration within open parameters ensures operability within different environments *and* adaptability to future needs.

But there's more to our global solutions than technology alone. There's also our unique network of more than 80 worldwide offices, for product development, sales, and service. This network provides a pool of talent that benefits *all* users of Software AG products, everywhere.

All of which helps explain why, for global solutions to its business problems, the world turns to Software AG.

For more information about Software AG, call toll-free:
1-800-843-9534
(In Virginia or Canada, call 703-860-5050)

SOFTWARE AG
PROGRAMMING BUSINESS SUCCESS

ADABAS 5, NATURAL 2, NATURAL Engineering Series, and ISA are trademarks of Software AG. VAX is a trademark of Digital Equipment Corporation. ©1988 Software AG of North America, Inc.

CIM taking care of business these days

BY JEAN S. BOZMAN
CW STAFF

CHICAGO — Computer-integrated manufacturing (CIM) integrates a company's business functions as much as its manufacturing process. That was the message trumpeted at the Advanced Manufacturing Systems (AMS) conference held here last week.

"INTEGRATING the business function is just as important as bringing engineering and manufacturing closer together."

RICHARD KAHN
PEAT, MARWICK, MAIN & CO.

"Our focus on CIM was on three areas this year: engineering, manufacturing and marketing," said Richard Kahn of Peat, Marwick, Main & Co., which acted as systems integrator for this year's Impact demonstration of CIM. "Integrating the business function is just as important as bringing engineering and manufacturing closer together."

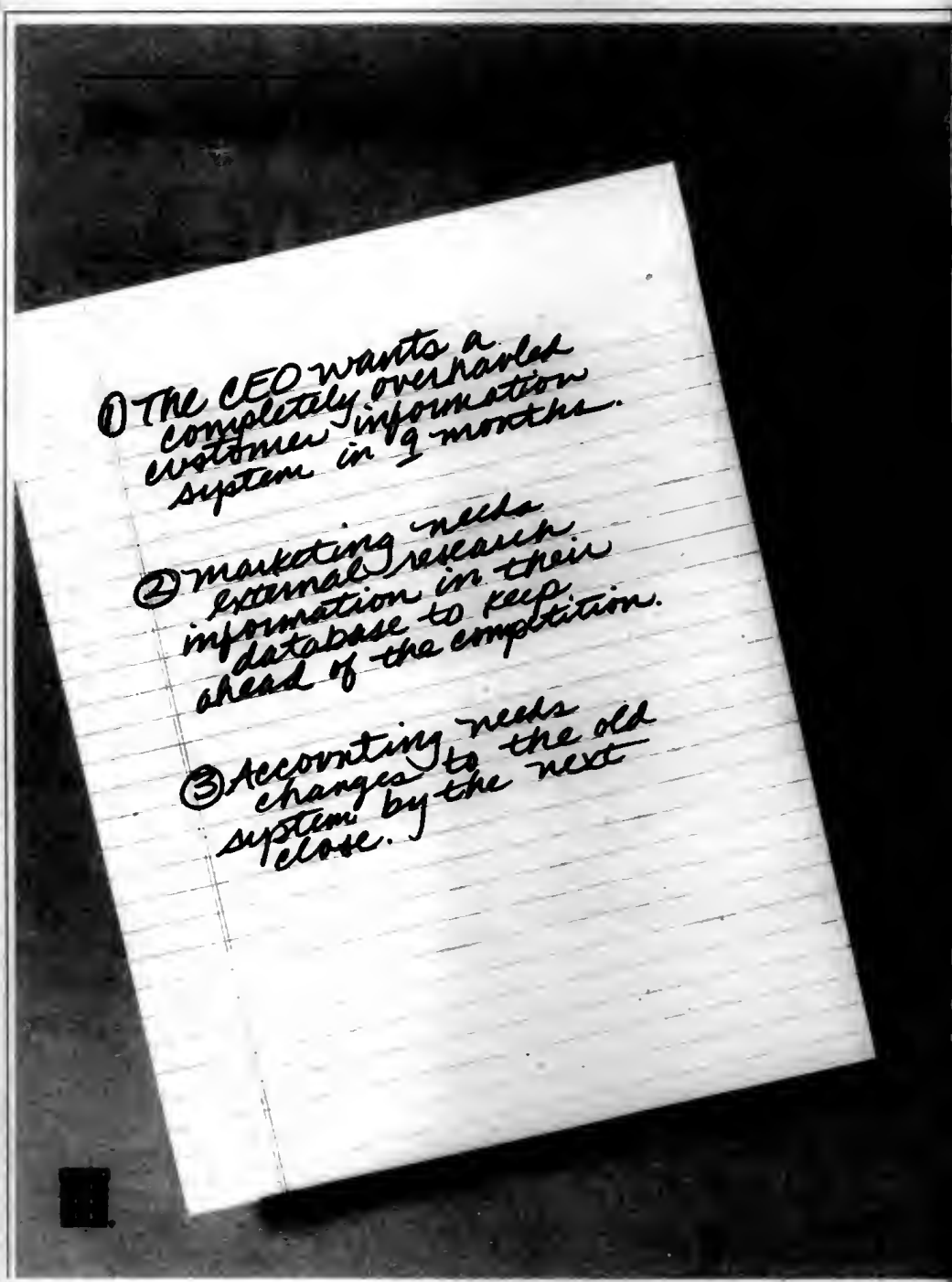
Impact, somewhat shortened and simplified since last year's one-hour-plus presentation, featured videos showing the five-year progress of CIM in a fictitious company, ATR Industries. At the end of the 45-minute presentation, Impact visitors toured an on-site mini-factory.

Surrounding Impact were displays spread over 50,000 square feet of exhibit space — about 10,000 square feet less than at last year's AMS show, according to the sponsor, Cahners Exposition Group. Impact alone took up 6,000 square feet. Some of AMS's 140 booths repeated their themes of last year, including Tandem Computers, Inc.'s Tandem Integrated Manufacturing Environment, or TIME, CIM system, Allen-Bradley Co.'s CIM Cell exhibit and Stratus Computer, Inc.'s demonstration of its XA 2000 on-line transaction processing system.

New developments

There were some new developments, including these:

- Intergraph Corp. in Huntsville, Ala., announced the first major revision of the Intergraph Engineering Modeling System. The Intergraph Clipper workstation-based drafting and design system features more drafting functions, a simplified user interface and a greater ability to handle modeling of surfaces and solids.
- Pansophic Systems, Inc. in Oak Brook, Ill., introduced an inventory control module for its Pansophic Manufacturing/38 software. The Forecasting Workbench module allows users to monitor manufacturing material and production forecasts from a single screen on their IBM System/38 computer.
- Prime Computer, Inc. in Natick, Mass., demonstrated its Design solid-modeling software and Control flexible manufacturing system. Control directs the flow of information stored in a common Oracle Corp. data base from engineering to manufacturing systems, updating drawings as needed. Design allows users to create, rotate and enlarge engineering drawings, whether they are wire-frame, three-dimensional or solid-modeling.
- Carnegie Group, Inc. and Texas Instruments, Inc. demonstrated Carnegie Group's new Testbench knowledge-based troubleshooting software for the repair of complex machinery such as cars and motorcycles. The Testbench package runs on TI's Explorer workstation, and both companies will market the package, according to Carnegie Group Chief Executive Officer Dennis Yablonsky.



Publishing: Beyond WYSIWYG

BY JEAN S. BOZMAN
CW STAFF

CHICAGO — WYSIWYG, the electronic publishing systems acronym for "what you see is what you get," has taken a backseat to a new phrase. Vendor marketing executives at last week's Corporate Electronic Publishing Systems (CEPS) show, held here, said the name of the game is now: "what you don't see is what you need."

"This is the year we all get to go through the looking glass," said David Henry Goodstein, chairman of the CEPS conference and president of Interconsult, Inc. in Cambridge, Mass. "We want to get beyond the shimmering goal of WYSIWYG and decide that electronic publishing is all about information management," he added.

And so it was that icon- and mouse-based graphics have won the battle of the interface, which raged at last year's CEPS show. The icon presentation was shown at most of the 70 booths here. IBM's April 5 endorsement of Interleaf, Inc.'s icon-based publishing package seems to have underlined the company's earlier move to include Microsoft Corp.'s Presentation Manager in its Personal System/2 line.

New frontiers

Accordingly, the discussion at CEPS moved on to other issues: networking, distributed data base management and micro-to-mainframe links. "WYSIWYG was just the tip of the iceberg," said Howard Woolf, manager of Digital Equipment Corp.'s Electronic Publishing Systems Group.

"The desktop is just another island of automation," Woolf continued. "People need to have access to accurate and timely information on their desktop — and that can only be achieved by the delivery of publication services throughout a corporation's network."

Examples of these services include printing, central storage in a data base and electronic distribution of documents, Woolf said.

Storage in a central data base was the theme at IBM's booth, too. Documents created on both IBM mainframes and the PS/2 Model 80 — the only PS/2 model that supports Interleaf's Publisher software — can be combined into central data bases for compilation and centralized publication.

IBM also demonstrated recently revised versions of its Processmaster, Bookmaster and Browsemaster mainframe-based publishing software, all of which were shown running on an IBM 9370 Model 60 under the firm's VM operating system.

Apple watchers

Apple Computer, Inc.'s crowded booth drew the sparsely attended show's largest crowds. Apple Macintosh IIs, many showing color graphics on high-resolution screens, overpowered monochrome demonstrations on Macintosh SE models.

However, Larry Tesler, Apple's vice-president of advanced technology, asserted that his firm is attempting to expand its definition of electronic publishing to include multimedia presentations.

Building on its Hypercard data base management system, Apple is working on compression techniques that would lower the cost of electronically storing audio and video clips on compact disk/read-only memory, Tesler said.

CORRECTIONS

Figures for the network management forecast Data View were supplied by Frost & Sullivan, Inc. [CW, April 11].

Thomas O'Flaherty is director of research at Broadview Associates, a Fort Lee, N.J., information technology mergers and acqusitions firm.

EDITORIAL

For shame

IMAGINE WHAT WOULD happen if General Motors announced it was teaming up with Goodyear to develop a new radial tire for small cars. The tire would be a different size than other tires and would feature a proprietary design created by Goodyear. GM and Goodyear would announce that the new tires would be the basis for all their future small cars and that both would scrap their line of existing tires in favor of the new incompatible "standard."

Now imagine that GM also cut a similar deal with Firestone to design another line of radial tires. These tires would use a different sizing scheme from the GM-Goodyear tires and wouldn't fit any of the same cars. Competitors would be free to adopt the new design but only after GM and Firestone had completed development and released their own line of products.

This mythical scenario is not that far removed from the ridiculous drama now being played out by AT&T, Sun Microsystems, Microsoft and other Unix vendors. And, like a confused car buyer in the automotive example, it is the computer users who stand to lose.

AT&T and Sun have joined forces to create a graphical user interface for Unix that they plan to publish as an industry standard. The deal is a coup for Sun, which has now been anointed to co-develop an operating system destined for standard status. But it's also a snub at Microsoft, which has a similar co-development deal with AT&T for a product called Unix386. Microsoft has industry-standard plans of its own in the form of Presentation Manager, but that graphical interface was apparently passed over by AT&T in favor of Open Look.

Dozens of other Unix companies were also omitted from the AT&T-Sun party. They won't be permitted to get the kind of advance peek at future Unix specifications that Sun gets from the deal. IBM was left out as well. It has chosen the Presentation Manager for its interface standard, a fact that no doubt contributed to AT&T's decision to choose something else.

Now, computer buyers must sit on their hands while the industry leaders play out their little soap opera. It's ironic that Unix, broadly perceived as a portable and standardized operating system, should be the subject of so much conflict. It's a pity that vendors are sniping at each other when they could be banding together to offer a stable alternative to the embattled Presentation Manager.

Shame on AT&T for trying to trump IBM and Microsoft by introducing yet another element into the battle. Shame also on the dozen or so software and hardware vendors that announced vague intentions to "evaluate" Open Look at the AT&T press conference. They should either make a commitment or stay out of the picture.

It's time now for users to state their case. Do you really want to become embroiled in a marketing war with your own corporate standards as the battlefield? Better to snap the wallet shut and let your Unix suppliers know it will stay shut until they can resolve their differences.

LETTERS TO THE EDITOR

What was meant

In a recent story [CW, March 28], I was quoted as saying that the IBM 3380 Model J and K drives were performing better than the competitors' drives. What I meant to say was that they were performing better than comparable IBM drives. The difference is a very large one, and the IBM drives are, in fact, not performing better than some of the competitive drives.

Larry J. Martin
Vice-President
Reliability Research, Inc.
Norwalk, Conn.

New ball game

The search for talent in dynamic, technology-driven disciplines, like MIS, will continue to worsen as the overall work force and unemployment shrink [CW, March 7]. Companies that rely on dependable sources of talent — advertising, college recruiting, internal referrals — will have a difficult time satisfying their needs in specialized functions.

Organizations that find it difficult now should seriously evaluate their corporate attitude toward employment so they can adjust their methods and expenditures to meet the current climate. Organizations should base employment decisions on skills and traits, not experience. This will allow them to attract and retain people who share common values with the organization.

In hard-to-hire areas, consider using a specialist to solve your problem. Go to someone who looks for these people every day, not just when the need arises. Sources are available for all skill sets regardless of how scarce, but it takes a changed attitude, creativity, perseverance and looking in the right places using the right techniques to successfully solve today's problems.

It will be a progressive company that will evaluate its employment procedures and techniques now to meet the challenges of today and the years ahead.

James E. Doherty Jr.
Systems Personnel, Inc.
Media, Pa.

For the record

Wang Laboratories, Inc. would like to set the record straight regarding references to the relationship between Wang and Computer Partners, Inc. in "Strategic systems plans gone awry" [CW, March 14].

In contrast to opinions attributed to an anonymous former Computer Partners consultant, Wang has had a fruitful relationship with Computer Partners. Their expert consultation was instrumental in helping Wang design and implement an ambitious set of management information systems that are in place today and working splendidly.

There were some redirections that led to periodic delays in the completion of the project. They were not due to any lack of effort or ability on the part of Computer Partners, as your source implied, nor was Wang required to "correct the situation left by Computer Partners." As planned from the start, the role of Computer Partners was assumed in phases by Wang personnel. Wang found Computer Partners to be a fine firm with excellent resources and management techniques that, combined with Wang talent, served to deliver some good solutions.

Wang is not, as the article stated, redoing its entire order processing system again. During the period discussed in the article and in subsequent years, Wang's internal systems have vastly improved the company's relationship with its customers. The information systems development process is a dynamic one in which system enhancements are performed regularly.

Bradford R. Sweet
Group Director, CIS
Computer Operations and Technical Support
Wang Laboratories, Inc.
Lowell, Mass.

Shocking reaction

I find it personally shocking when a relatively bland and innocuous *Computerworld* article, "Independents' backs to the barricades," [CW, Feb. 1] generates such a barrage of hate mail. If the letter writers [CW, Feb. 29 and March 7] show this utter contempt for independent contractors, who do not work for them, then how do they feel about the people who do work for them? With attitudes like this, it is surprising that we do not have programmers' unions.

The self-righteousness of those letters disguises the fact that they are taking bread out of my mouth and money out of my wallet. What's the matter? Did the article threaten the windfall profits their companies are making from Section 1706?

Phil Nowak
Chicago

Computerworld welcomes comments from its readers. Letters may be edited for brevity and clarity and should be addressed to Bill Laberis, Editor, Computerworld, P.O. Box 9171, 375 Cochituate Road, Framingham, Mass. 01701.

Sometimes, more is too much

Intelligent text retrieval will let you find the needle in the haystack

HARVEY NEWQUIST

Throughout computing history, one concern has overridden all others as we progress from software level to software level and hardware architecture to hardware architecture. That concern is MORE.

More speed, more power, more memory, more functions, more features, more users, more flexibility, more everything. We really want more of all these things an we can store more information in more places. That is the bottom line, more or less.

Yet, as we strive for this goal, we've created a data world in which information goes in but does not always come out. We've found enough ways to put information in: scanners, digitizers, mice, voice systems, joysticks, digitizing tablets, electronic mail messages and on and on. If it is in paper form, we want it on computer disks an it can be accessed electronically.

There is one problem with an much "more" going in: How are we supposed to get out the exact bits and pieces of information we need? Think of all the times you've reached into a four-drawer file cabinet and have not been able to find that one piece of paper critical to today's meeting.

On a larger scale, think of going into the Library of Congress, where just about all of the world's printed material resides. Then ask for something specific, such as *A Collection of Edgar Allan Poe's Short Stories*. Imagine the librarian saying, "The volume is in there somewhere, probably under fiction." Well, that's a big help; it limits your search to about eight million books instead of 20 million.

A similar situation is being created in computerdom today.

In the last few months, there has been renewed interest in the problem of getting out specific pieces of all the "more" that went in. The effort is being exerted by a segment of the computing community that exists just between artificial intelligence and text management. The concepts behind "text-based management systems" and "intelligent text retrieval" are the hottest things since this morning's on-line headlines.

Essentially, the goal is to create software management systems that allow any user to define what kind of information is relevant to him. In so doing, the user creates a sort of filter and priority system, which sorts through the information contained in all those hundreds and thousands of data bases.

Thus, instead of getting a huge load of data dumped onto

Continued on page 23

TOM LULEVITCH

Newquist writes and consults on artificial intelligence and other advanced high-technology topics from his office in Scottsdale, Ariz.

Oh, holy copyright! God's suing

DOUGLAS BARNEY

In a move unanticipated by computer analysts, God himself has filed suit against nearly the entire software industry for violation of a long-standing audiovisual copyright.

The suit, filed last week in East Heaven District Court, alleges that all computer firms, including Apple Computer, Inc., Lotus Development Corp. and Paperback Software International, have illegally copied God's original look and feel.

God, however, declined to file suit against Microsoft Corp. and its well-compensated founder Bill "Pearly" Gates. "I can't very well sue my business partner, now can I?" God said in an exclusive interview with Oral Roberts last week.

Contrary to popular belief, pull-down menus, windowing and icons did not originate at the Xerox Palo Alto Research Center but at St. Peter's Research Center. "Heck, I used a graphical user interface when laying out the continents and ran the program on my heavenly host," God said.

As the ultimate creator, God also claimed ownership of all software innovations. According to the perfect logic behind the suit, God created man in his own image. Man in turn created software based on God's intellectual property. Therefore, God created software, the suit claimed.

"All software was created either by me or in my own image — that is except for Topview, which was Lucifer's doing. Now these upstart firms are selling my creations and making millions," God said. Lucifer could not be reached for comment, but sources close to the fallen angel described his reaction as "heated." When asked who would hear the case, God replied, "I'll be the judge of that."

In fact, because of one of God's copyrights, Microsoft's popular word processing package, originally called God's Word, was renamed Microsoft Word.

"Bill and I teamed up on that one, but I was left out of developing Windows," God claimed. "Maybe that's why it was an late."

God was surprisingly blunt when asked about the recent lawsuit by Apple alleging copyright violation against Microsoft. "I knew a firm named Apple was bound to be bad," he said.

Apple President John Sculley shrugged off the suit. "I wrote the Book of John, called *Odyssey*. And I created a miracle by giving the Macintosh expansion slots, something Job, I mean Jobs, refused to do."

The suit seeks an unspecified number of pennies from heaven and an immediate injunction preventing all software vendors from distributing products. It also asks that computer journalists stop taking God's name in vain, goshdarnit!

Barney is a *Computerworld* senior editor, microcomputing.

An Apple's an Apple, and a suit's a suit

AMY WOHL

Life is settling down again in the computer industry. For a few weeks we were agitated, perturbed and perhaps even distressed: Apple was suing Hewlett-Packard and Microsoft, claiming infringement on its Macintosh interface.

There are the obvious issues, as well as some obvious answers:

- Can Apple claim an interface that was actually developed by Xerox? Probably not.
- How similar do two interfaces have to be for one to be an infringement on the other's copyright protection? The legal term specifies "substantially similar." Based on prior decisions, that phrase seems to mean "virtually identical."
- Did Microsoft actually have a valid license to the interface? Maybe.
- Had HP previously applied to Apple for a Macintosh interface-appearance license and been turned down? HP says it asked for information about a license and never received a reply; an Apple spokesman says HP applied and was turned down.

Emotions run high

Let's look at the real reasons why some Apple employees are embarrassed, Xerox employees alternately furious and triumphant and industry gurus, while never speechless, are puzzled.

The industry feels strongly that while Apple can claim a few bits (or bytes) of the Macintosh interface, most of its components were developed at SRI International in the 1960s and at the Xerox Palo Alto Research Center in the '70s.

The mouse pointer, the idea of windows and pull-down menus, the concept and even the appearance of icons all predate the design and announcement of the Macintosh product.

Too, there is the widespread belief that if Xerox permitted Apple to use its innovative concepts in the Lisa and the Macintosh, Apple should be pleased that its refinements are being further used and refined.

Also, the computer developer community is a close-knit tribe. They often think of themselves more as brother scientists, partners in creating better and better products rather than as employees of aggressively competing corporate empires.

Apple has nearly always been a proponent of the brotherhood of computer developers and users and has often profited from the friendly feelings the community has held for it. For many, this lawsuit creates the uneasy feeling that Apple has joined the world of big corporations. Left behind is the noble pursuit of building the best products because that is what good people should do with their talents.

FOR MANY, this lawsuit creates the uneasy feeling that Apple has joined the world of big corporations.

Perhaps we were hopelessly naive. Perhaps the Apple that existed in our minds never existed in reality. Perhaps we must understand the inevitable laws and stresses of the marketplace.

Sincerest flattery

Nevertheless, we should not forget in our distress that the Macintosh is still one of the best computing environments available. That, in fact, is why it has been paid the compliment of imitation.

But it is the discipline with which Apple surrounded its interface, rather than the exact appearance of the interface itself, that makes the Macintosh different and appealing.

Macintosh-like environments on other platforms come with similar interfaces, but they do not show the same interface predictability or discipline. Too many popular applications with too many different interfaces already exist.

DOS environments must compromise to accommodate the continuing use of this existing software. Windows, Presentation Manager and New Wave will all run new programs as well as the old DOS programs, each with its own dissimilar interface.

The bottom line is this: The Macintosh offers ease of use at the cost of somewhat less flexibility; DOS (and OS/2) will offer more flexibility but less ease of use. You pay your penny and you take your choice.

Few believe that this lawsuit is really about Hewlett Packard's New Wave product. (The product, by the way, is worthy of notice. In fact, a very real by-product of Apple's lawsuit may be the additional attention it will bring to New Wave. Perhaps HP

Continued on page 23

Wohl is president of Wohl Associates in Bala Cynwyd, Pa., and editor of "The Wohl Report on End-User Computing" newsletter.

Service in a whole new light.

ALCATEL CORTELCO®
Second Largest U.S.
Manufacturer of Telephones
and Key Systems

ALCATEL COURIER
3270-Compatible
Controllers and Displays

FRIDEN ALCATEL
Innovative Supplier of
Postage Meters, Mailing and
Shipping Systems

ALCATEL PABX SYSTEMS
Supplier of Advanced
Small and Medium Size
PABX and Key Systems

ALCATEL IS SERVICE

Actually, Alcatel is a synergy of leading information processing and communications companies working together to offer you the systems and services your business needs to compete, prosper and grow.

Such companies as Alcatel SERVCOM.

For nearly 20 years, SERVCOM has maintained and serviced over 400 types of data processing and communications equipment—from PCs to PABXs to mainframes.

And Alcatel SERVCOM does everything from on-site service and depot repair to installation, relocation and whole unit refurbishment.

In fact, SERVCOM's reputation for quality service—customized to the way your company does business—has established SERVCOM as one of the leading independent service organizations in North America.

Now as part of $13 billion Alcatel, SERVCOM shares the technical, financial and professional resources to serve you and your business better than ever.

So take a close look at the comprehensive solutions Alcatel has to offer. When you do, you'll see what we mean by "Service in a whole new light."

ALCATEL

For more information on the Alcatel companies,
call 1-800-556-1234 (ext. 247) or in California 1-800-441-2345 (ext. 247);
or write Alcatel Business Systems, 1623 Buckeye Drive, Milpitas, CA 95035.

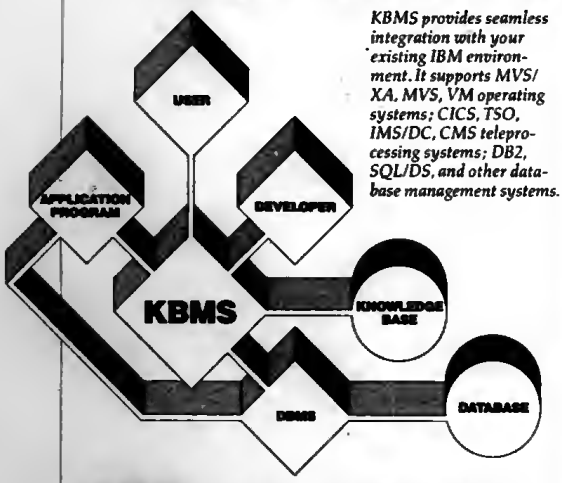
ALCATEL QUME
Leading Manufacturer of Computer Peripherals

ALCATEL SERVCOM
Computer Maintenance and Support Services

ALCATEL XTRA BUSINESS SYSTEMS
High Performance Single and Multiuser Computers

*Formerly Apparatus Division of ITT Telecommunications.
**Formerly ITT Business Communications Corporation and Thomson CSF Operations.

INTRODUCING KBMS.®
THE FIRST KNOWLEDGE BASE SYSTEM FOR PRODUCTION APPLICATIONS.



KBMS provides seamless integration with your existing IBM environment. It supports MVS/XA, MVS, VM operating systems; CICS, TSO, IMS/DC, CMS teleprocessing systems; DB2, SQL/DS, and other database management systems.

A major computer company is saving over $25 million a year on product ordering and configuration, thanks to expert systems they developed in-house.

A leading financial services company has substantially reduced bad credit losses with a computerized system they developed based on artificial intelligence.

These are true stories. Yet expert systems still have not taken a serious place in the business world.

Why? Because they've been available only on specialized systems using esoteric languages like LISP and PROLOG. So, like the companies described above, you could only benefit from knowledge-based systems if you had a great deal of money, people and time to make them work.

Until now.

THE PRACTICAL BREAKTHROUGH: FULL INTEGRATION WITH IBM AND DATABASE SYSTEMS.

Now AICorp has developed a knowledge base management system called KBMS that is ready to take its place –along with database management and fourth-generation languages–as a major competitive business tool.

KBMS is a mainstream software system that is an extension of conventional DP practices. It provides seamless, high-level integration with your existing applications and databases.

The system runs under major IBM operating systems, teleprocessing systems and database management systems. It can be integrated with your existing applications by calling a KBMS module from a standard COBOL program, or vice versa. It even has the speed and processing power to be used in high-volume, transaction processing applications.

Perhaps most important of all, you can implement KBMS using the experience, hardware and software investment you have in place already.

IMPLEMENT A NEW CLASS OF APPLICATIONS.

KBMS makes it possible for you to develop practical solutions for whole new applications areas–applications that are strategic and crucial to your business, but simply have been too complex to solve with traditional, procedural programming approaches.

For example, manufacturing companies can use KBMS to build an expert system for reviewing every incoming order for proper configuration. Insurance companies can use it for underwriting decisions to guarantee that corporate policy is always followed. Energy generating companies can use it to better predict energy needs. And financial organizations can use KBMS to enforce credit approval guidelines.

Any business problem that is complex, governed by many interrelated rules and policies, and subject to frequent change is a candidate for KBMS.

HOW KBMS WORKS.

KBMS, which stands for Knowledge Base Management System, incorporates the four key techniques of AI programming methodologies: goal-directed reasoning (backward chaining), data-driven reasoning (forward chaining), hypothetical reasoning, and object-oriented programming.

By combining these techniques in one integrated system, KBMS gives your business applications the full "reasoning" power of expert systems technology, allowing you to address a wide range of applications with a single product.

A FREE SEMINAR WILL SHOW YOU HOW KBMS CAN GIVE YOU A COMPETITIVE ADVANTAGE TODAY. CALL (617) 890-8400.

AICorp, a developer of AI-based mainframe applications for more than 10 years, and the creator of the INTELLECT™ natural language system, is holding a series of seminars that will show you how KBMS can provide a measurable, significant and immediate return on investment for your company.

To register for the seminar in your area, please call (617) 890-8400. AICorp, 100 Fifth Avenue, Waltham, MA 02254-9156.

AICORP

Bringing AI Software to Business

AT LAST.
A PRACTICAL KNOWLEDGE BASE MANAGEMENT SYSTEM FOR YOUR IBM MAINFRAME ENVIRONMENT.

KBMS is a registered trademark and INTELLECT is a trademark of AICorp, Inc

More

CONTINUED FROM PAGE 19

the computer (like downloading the entire *Wall Street Journal*), the user receives a sifted version based on rules about what is important, relevant and desired.

Companies like Brattle Research Corp., Intelligent Technology Group and Information Access Systems, Inc. are working on ways to tailor information retrieval to the needs of each user.

What do The Beatles make?

Suppose I wanted to sift through a data base of articles published during the last five years concerning the entertainment industry. These articles may have been culled from *Billboard*, *Variety*, *The New York Times*, the *Los Angeles Times* and numerous trade publications.

For this inquiry, I want only information on how much money is being made by the renewed interest in The Beatles' music — reissued compact disks, television commercials, videos and so on. Key-word searches would probably get me everything from information on Beatles' fan club gatherings to George Harrison's ramblings about Indian mysticism.

Now let's apply a little intelligence to the retrieval process. In my system, I have already defined "financial matters" as being the issues directly related to, one, money and how it is made and used; two, economic and business pursuits; and, three, licensing, royalties, remuneration and compensation.

I have also defined the individual members of The Beatles, key people associated with the group, such as managers and wives, and miscellaneous areas, such as Apple Records, fan clubs, record albums, movies and so on.

At this point, the textual data can be searched and weighed against the information I provided as guidelines for the system, based on rules I outlined for it. Consequently, I should now receive only articles such as an interview with Paul McCartney on his wealth, an assessment of Nike's licensing arrangement for "Revolution" and comments from Ringo Starr as to the money he made from dressing up as a polar bear for Sun Country Wine Coolers. You get the general idea.

The intelligent clerk

Remember that this retrieval technology is still in its infancy and so is not yet functioning to its potential. But I am getting what I need, not whatever the system decides to dump on me. Of course, I must tailor the system, spending time defining certain terms and their relative importance in light of other topics.

The whole idea is to look at the computer retrieval system as an intelligent clerk or librarian. The more this assistant knows about what you're looking for, the closer he can come to getting you exactly the information you need. Intelligent retrieval systems may be put onto on-line data bases. Think of how your information overload could be lessened: Instead of scanning four newspapers a day, page by page, you could create your own filter that gives you the topics you already know you'll be looking for. The system omits noise — topics that are nothing but clutter in your daily information intake.

Although intelligent text retrieval has not yet been perfected, it holds the promise of allowing you access into the information void into which so much data has disappeared.

Apple

CONTINUED FROM PAGE 19

should send Apple a thank-you note?)

Rather, the lawsuit is broadly perceived as a trial balloon, a kind of warning to IBM that the Presentation Manager — based on Microsoft's Windows — is also subject to Apple's examination and possible future litigation. In fact, many believe the real point of the lawsuit is to discourage developers from spending resources on the OS/2 Presentation Manager and to redirect them to the Macintosh camp.

Interest in the suit is already ebbing. Developers have correctly decided that this is Apple's and Microsoft's problem and that Apple has promised not to come after software developers on this issue.

Of course, if Apple succeeds in removing Windows from the marketplace, developers will have difficulty in finding a market for their Windows-compatible programs. Also, if Apple intends to pursue this case through the courts with, as its spokesman says, no intention of settling and no desire to speed things up, the process will take a dozen years — plenty of time for others to write and profit from two or three generations of software.

Let's get on with it

This lawsuit seems to embody much larger issues than the appearance of an icon or a menu. We need to learn the proper relationship between protecting unique intellectual property developed by a single company with the intention of making a profit and the interworkings of jointly developed concepts and ideas that belong to the complex network of developers, scientists, users and vendors that make up the computer industry.

I suspect we are all too dependent on our colleagues and competitors to give up those relationships and retreat to well-protected corporate ivory towers.

For if we did, we would then have to dream up the next generation of computers and interfaces without the intellectual stimulation that our unpredictable interactions provide. And, I suspect, none of us is prepared to be quite that lonely.

Why We're Betting a Million Lines of Code on the SAS/C™ Compiler.

At SAS Institute Inc., we've invested more than 10 years of research—and over a million lines of code—in the SAS® System, the world's leading data analysis software. So you can bet we left nothing to chance when we chose the C language for the next generation of our software.

We selected C for the portability it would bring to the SAS System, but weren't about to risk our code on just any mainframe C compiler. So we tried them all. When none could meet our exacting requirements, we created our own: the SAS/C compiler.

We Developed It.

Support It. Use It.

The SAS/C compiler set new standards for efficiency and technical quality, with:

- A source-level debugger that includes structure display, ABEND recovery, and debugger I/O exits for debugging specialized applications
- Reentrant object code
- Highly optimized generated code
- Use of standard IBM linkage conventions, with support for 31-bit addressing
- A CMS Rexx/TSO CLIST interface
- Support for signal handling including program checks and terminat interrupts, and non-standard signals such as timer interrupts and stack overflow
- Many built-in functions including string handling
- In-line assembler.

SAS is a registered trademark of SAS Institute Inc., Cary, NC, USA. SAS/C is a trademark of SAS Institute.

Copyright © 1987 by SAS Institute Inc.
Printed in the U.S.A.

And when we combined these features with outstanding technical support and frequent updates—both provided free—software developers everywhere took notice. The SAS/C compiler is now the market leader, installed in hundreds of commercial firms and academic institutions.

Test It. Compare It.

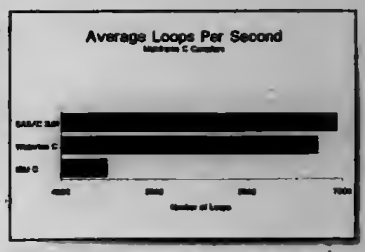
FREE for 30 Days.

We're betting you've set the same high standards. That's why we'd like to send you the SAS/C compiler, under OS or CMS, for a free 30-day evaluation. We'll also send you a free copy of a leading benchmark program. Compare our compiler with any other. Odds are, you'll choose the SAS/C compiler.

Just mail the coupon below. Or call your Software Sales Representative at (919) 467-8000.

SAS Institute Inc.
SAS Circle ☐ Box 8000
Cary, NC 27512-8000
Phone (919) 467-8000
Fax (919) 469-3737

Using a C version of the Dhrystone benchmark, the latest SAS/C compiler release produces the fastest code among the top 3 mainframe compilers. It even tops our own previous release by 35%.



I'd like to put the SAS/C™ compiler to the test with a free 30-day trial, and my free copy of the Dhrystone benchmark program. Give me the details.

Please complete, or attach your business card.

Name _____ Title _____
Company _____
Address _____
City _____ State _____ ZIP _____
Telephone _____ CW25APR88

Mail to: SAS Institute Inc., Attn: CC, SAS Circle, Box 8000, Cary, NC, USA, 27512-8000

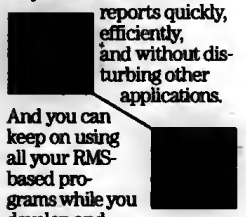
We've just cut five years off your relational DBMS conversion time.

To get the advanced capabilities of a relational database, you used to have to go through a lengthy, complicated, costly conversion.

Not anymore. Introducing the INGRES RMS Gateway—the first in a line of database links that let you apply relational DBMS power to older file management systems right now. Today. Without changing a thing.

The RMS Gateway makes RMS data appear as relational tables within an INGRES database. It lets you apply all the INGRES advantages—like easy user interfaces, industry-standard SQL, and powerful 4GL tools—while protecting your investment in data and applications.

Now you can generate all your decision-critical reports quickly, efficiently, and without disturbing other applications.



And you can keep on using all your RMS-based programs while you develop and implement new INGRES systems using the same data.

Best of all, the power of INGRES allows you to access RMS data across different hardware, networks, and operating systems—transparently—from anywhere in your organization. You can even combine INGRES and RMS data in any application.

What's more, an INGRES dBASE III Gateway is now available for data trapped in old PC files. And gateways to IBM's IMS, DB2 and SQL/DS are on the way.

No other relational database offers you these instant links to older data files—making INGRES the one relational DBMS you can put to work immediately.

Which could help put you years ahead of the competition.

Get the INGRES advantage—call 1-800-4-INGRES for more information.

INGRES

RELATIONAL TECHNOLOGY

1080 Marina Village Parkway, Alameda, CA 94501

ARMS001CW

SOFT TALK

Charles Babcock

IBM flexes DB2 muscles

With its announcement of DB2 Version 2.0, IBM is trying to leave the debate over relational performance behind and open a new era of relational data base use.

The relational approach brought a flexibility to the data base field that its predecessors lacked. But the price of open-ended access, many users intuited, was unpredictable performance. Even the relational advocates admit that an SQL query may take either four minutes or four days, depending on how it is phrased.

Perhaps the most emblematic feature of Version 2.0 is its resource governor. The data base administrator may now impose restrictions on how long a query will run and the number of CPU cycles it will consume. Offering this level of control over DB2 removes one of the hangups of using a relational data base in the production environment.

Indeed, with its much faster transaction processing capabilities, IBM has set a standard for relational performance on its 3090E series mainframes that threatens to leave its competitors far behind. In the past,

Continued on page 29

MSA growth hardy, profits low

Chairman Imlay says acquisitions hurt firm's profits in 1987

Management Science America, Inc. (MSA), the Atlanta-based applications giant, held its annual users group meeting in Chicago last week. The following is an interview with MSA Chairman John Imlay conducted by *Computerworld* senior writer Rosemary Hamilton before the meeting.

MSA has recently gone through financial difficulties and has seen the departure of a dozen executives. What happened?

Revenue last year increased 43%, independent of the acquisitions, so that means growth. But we had decided to make a change in revenue recognition, meaning we took out almost $70 million.

MSA's Imlay

At the same time, the acquisitions cost us more than we anticipated.

RTS [Real Time Systems, an MSA European subsidiary] gave us grave difficulty. The strategy of RTS was outstanding. But the losses were much more than expected. The sales didn't materialise, but the expenses went right along.

We determined that to be more profitable, we needed to streamline. We had Advanced Manufacturing, Inc. [an MSA group] as one company and the rest of the products as another. But those two companies were pulling apart.

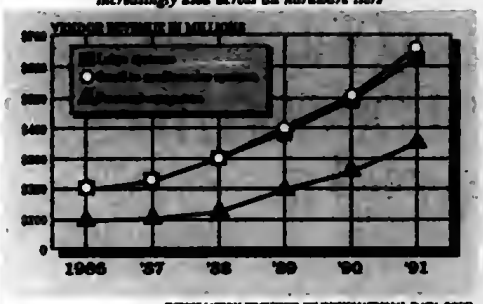
So what we did was streamline that organization. And Dennis [Vohs, former president of Advanced Manufacturing] wanted to be a chief operating officer-type of person and did not want to go back to development. So he left the company. With him, a whole Advanced Manufacturing

Continued on page 28

Data View

Banking software draws interest

Over a six-year period, banking and financial packages will be increasingly used across all hardware tiers



INFORMATION PROVIDED BY INTERNATIONAL DATA CORP.

Nastec links CASE, Telon

BY NELL MARGOLIS
CW STAFF

SOUTHFIELD, Mich. — In pursuit of a total CASE environment, Nastec Corp. recently announced an interface between its CASE 2000 Designaid front-end computer-aided software engineering system and Pansophic Systems, Inc.'s Telon application generator.

The Telon Interface Option creates a bridge from the specification and design stages of the

Continued on page 29

CASE focus on quality prescribed

BY CHARLES BABCOCK
CW STAFF

Implementing computer-aided software engineering (CASE) tools and methodologies is likely to succeed if a shop's goal is quality, but most implement CASE to achieve productivity, CASE consultant Vaughan Merlyn said last week.

When quick productivity gains do not occur, the tools become "shelfware," noted Merlyn, president of Bellevue, Wash.-based CASE Research Corp. Merlyn made his remarks at the Atre Computer Assistance forum on relational data base and CASE in Arlington, Va.

Those who advocate CASE frequently find they can implement it on a trial basis, but this is part of the shortsighted, productivity-oriented approach, he added.

"Most trials end in a hanging," Merlyn warned, "and the CASE tools get hung."

Instead, a site that wants to

Continued on page 27

Inside

- Duquesne enhances MVS, JES supervisor. Page 26.
- Ross welcomes Access to the MAPS family. Page 27.
- Universal offers disk management tool for IBM systems. Page 30.

PLATINUM technology the DB2 Company

For the best in DB2 products, education, & services

Assure your success using DB2, invest in a PLATINUM Software Portfolio. DB2 Software, Standards, Education Curriculum and Professional Services available from your local PLATINUM affiliate worldwide.

For more information please write or call:

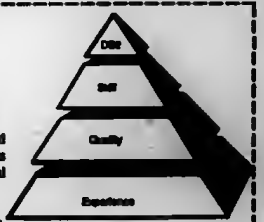
PLATINUM technology, Inc.
555 WatersEdge Drive
Lombard, IL 60148

(312) 620-5000

DB2, QMF, and CSP are products of IBM.

APRIL Portfolio Spotlight

The PLATINUM Education Curricula



Our professional education program is built on a solid foundation of Skill, Quality, and Experience and provides the DB2 community with the most effective and practical approach to training. Our curricula includes:

- **Introduction to DB2** -- To get you started on your way to understanding the relational environment and the facilities of DB2.
- **DB2/SQL Application Programming** -- For a comprehensive hands-on knowledge of all phases of SQL programming.
- **DB2 Database Design and Application Planning** --To thoroughly understand the database planning & design process, based on ease of integration, maintainability and efficiency.
- **DB2 Database and System Administration** -- To give you the details needed to efficiently and effectively administer your DB2 environment.
- **CSP Application Programming** -- For a full understanding of how to design, code, and implement your DB2 applications using CSP.
- **Using DB2 and QMF** -- To introduce your managers & end-users to DB2.

Duquesne offers tests and reviews

PITTSBURGH — Duquesne Systems, Inc. has added a capability to its Automate/MVS operating system supervisor that helps a console operator test the rules he is using to automatically respond to IBM MVS and JES messages.

When used in conjunction with two other Duquesne system utilities, the operator can retrieve SYSLOG data — the job activity, error and event information messages that MVS and JES routinely put out to the system console. Usually the information is printed out from the console if it is saved, but Release 3.3 of Syslog Management and Retrieval and Release 4.1 of Joblog Management and Retrieval allow it to be saved on direct-access storage devices and tape. The information may also be selectively printed or called up for on-line review, said Gregory Coticchia, Duquesne's product group manager.

Once called back to the system console, Automate/MVS can take the SYSLOG data and run it against rules developed by the system operator as the correct responses to the messages. "You can retrieve archived SYSLOG and submit it to the product for testing. It gives you instant replay or playback," Coticchia said.

The testing capability was added to Release 1.1 of Automate/MVS. It is priced from $7,500 to $15,000, depending on processor size. Syslog Management and Retrieval and Joblog Management and Retrieval are priced at $7,500 for a site license.

How to prevent a computer from becoming a paperweight.

The multi-functional capabilities of Symphony 2.0 make any PC more productive.

Your company has a great deal invested in microcomputing. And one of your major challenges is to optimize that investment.

Lotus® Symphony® enables your PC users to get the most out of their hardware, and themselves. It provides all the power and versatility today's busy managers need in their multi-faceted jobs.

In a single package, Lotus Symphony combines spreadsheet, word processing, graphics, database and communications, putting five key business tools at their fingertips.

For PC users that means it's easy to move from one application to another, and they only have to learn one program. For you it means just one package to evaluate, teach and support.

Unlike many integrated packages, the depth of each Symphony application is not sacrificed for the sake of integration. Each function is powerful enough to meet the user's growing computing needs. In fact, the Symphony spreadsheet is based on the same technology as 1-2-3®, the industry standard.

And Lotus Symphony includes macros and a sophisticated command language for custom applications.

Plus, the newest version of Symphony, Release 2.0, has no copy protection and includes many new features, such as enhanced database and word processing, a spelling checker and text outliner, and faster spreadsheet performance.

So, don't let the potential of your PCs go unfulfilled.

Let Lotus Symphony help you get the most out of your investment.

Lotus Symphony 2.0

© 1988 Lotus Development Corporation. Lotus, Symphony and 1-2-3 are registered trademarks of Lotus Development Corporation.

Portability feather in firm's CAP

TORONTO — More and easier portability to IBM environments led the list of enhancements included in Netron, Inc.'s latest version of the VAX/VMS-based Netron/CAP Development Center, offered this week by the Canadian software company.

CAP, or computer-automated programming, is based on Bassett Frame Technology, an architecture developed by Netron Research Vice-President Paul Bassett that facilitates code reusability by segregating specific and generic software program components into "frames" that can then be accessed and copied as needed. CAP was designed as an application development system that allows for prototyping as well as easy-to-maintain applications, according to Netron.

The just-released Version 2.03 includes interactive debugging capabilities and a frame tree utility that produces a diagnostic listing of all frames, engineering breakpoints and custom code used in a program as it is developed.

The main emphasis in the latest CAP, however, was on easing the route to non-VAX hardware platforms for CAP-created applications. It included, according to a Netron spokesman, "improved portability for VAX-based development and maintenance of complex batch and CICS systems for IBM MVS and DOS/VSE mainframes."

CAP's design component underwent several modifications. All errors or omissions that would keep software developed on the VAX from working under the CICS teleprocessing monitor or IBM's MVS operating system are listed on Capscreen, so that the user can make modifications as needed.

The Netron/CAP Development Center is priced from $12,000 per user for a three-terminal license to $3,520 per user for a 50-terminal license. The IBM mainframe development option is available, starting with a five-terminal license, for an additional $40,000. Site licensing can also be obtained.

Ross and Access marriage begets new MAPS executive info system

BY NELL MARGOLIS
CW STAFF

PALO ALTO, Calif. — Ross Systems, Inc. has married its MAPS family of VAX-dedicated accounting software to Access Technology, Inc.'s 20/20 spreadsheet to offer an executive information system (EIS) tailored to the needs of financial executives.

Available immediately, MAPS/EIS features the 20/20 spreadsheet, an inquiry and reporting tool through which users can simultaneously use all Ross financial accounting applications, a link between the MAPS line and personal computer-based spreadsheets, a report writer that allows users to extract data from the MAPS general-ledger module and an Access Technology-crafted tool that gives users access to data bases directly from the 20/20 spreadsheet.

MAPS/EIS also includes an interface to Digital Equipment Corp.'s All-In-1 office automation software system.

Using the generalized EIS software products currently available, financial executives at large companies are likely to be inundated with information they do not need, said Sue Sweeney, Ross Systems' director of strategic marketing.

Time is money

As a result, she said, the user is saddled with a sorting task and a possibly time-consuming effort to find his bottom line with help from the MIS department — and all this comes on top of a huge bill for excess-function software and a cumbersome and expensive training period.

MAPS/EIS, on the other hand, "doesn't require an MIS department — it's so easy that accountants can use it by themselves," Sweeney said.

What is more, she added, the Ross offering, customised for the financial executive's needs, reduces the complexity of the generalised EIS product.

According to Sweeney, Ross Systems, which claims a 72% share of the mainframe-class financial software installations on the VAX, is in no way entering the generalised EIS market with MAPS/EIS.

"We made a conscious decision to remain very focused. We're sticking to the VAX as our only supported platform and accounting as our target industry," she said.

MAPS/EIS, which can be purchased as an integrated package or on a component basis, is priced from $3,500 to $15,000, depending on CPU and software configuration.

CASE focus

CONTINUED FROM PAGE 25

implement CASE should seek a management commitment to produce better quality software. Productivity gains are likely to follow, but quality can be established as the first systems come out of the development cycle. When challenged on that point, Merlyn said quality can be measured by the amount of maintenance a system requires, its ease of modification, its documentation and the consistency with which it meets system requirements.

Management too often views CASE as a product or set of products that will speed the development of applications. CASE is both a tool set and a disciplined methodology, and both must be implemented for a shop to gain the benefits of CASE.

Specification and design methodologies impose a common discipline on what otherwise becomes a highly individualistic craft, according to Merlyn.

Defense contractors overcame this tendency when the Department of Defense required that a delivered system match DOD requirements.

The requirement can be met through a CASE methodology but is hard to accommodate without it. So defense contractors tend to be consistent CASE users.

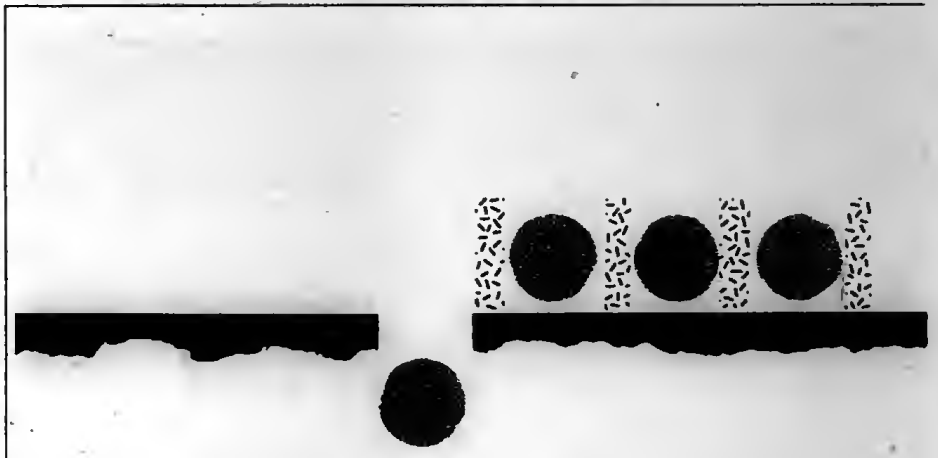
Projects the leading edge

The discipline and tool set imposed by CASE allow for much more effective project management, and the Europeans and the Japanese lead the U.S. software industry in this respect, he said. U.S. firms tend to use CASE to mobilise individual programmer's talents by augmenting them with as much workstation technology as possible.

In a survey of 42 IBM DB2 users, Merlyn found that 50% of them were also CASE users; a high percentage, considering that CASE vendors are believed to have penetrated only 3% to 4% of the possible market.

When asked why DB2 and CASE seemed frequently to go hand in hand, Merlyn said relational data base is not a prerequisite for successful CASE implementation, but the larger, more aggressive shops tend to be very data oriented and quickly recognise tools for working with it.

He said the DB2 shops also tend to express the most dissatisfaction with their CASE tools, indicating a desire to work at a higher level of performance than currently possible.



Bug Catcher.

InterTest® is the sophisticated, interactive debugging and testing tool that catches bugs before they wreak havoc on your complex CICS environments.

InterTest lets you set and remove program stops, control program execution, and inspect and modify program variables directly from complete COBOL, COBOL II, PL/1 or BAL source listing displays. Your CICS debugging will be faster, easier and more effective than ever before.

In addition, InterTest detects and prevents all application errors known to CICS. It puts you in control when an impending error is detected, rather than allowing CICS to terminate your transaction. You can correct or bypass errors right away—without wading through transaction dumps—and then resume testing without losing valuable time.

Best of all, InterTest's programmer-friendly menu screens and comprehensive Help Facility enable you to become more productive right away.

InterTest. It lets you catch the bugs before your programs go into production. Call today to start your 30-day product trial or for more information on InterTest. Find out for yourself why over 2,000 companies have made InterTest the industry standard. Reseller programs available. On-Line Software International, Inc., Two Executive Drive, Fort Lee, NJ 07024.

800-642-0177
In Canada, 416-671-2272/Europe, 44-1-631-3696

On-Line Software International
Authorities in IBM* Software

InterTest. *The Standard for Interactive CICS Debugging and Testing.*

IBM is a registered trademark of International Business Machines Corporation

Imlay

CONTINUED FROM PAGE 25

crew left at that time, too. Dennis is now looking for a position and so are those four or five others.

At the same time, we streamlined development. Again, we were not making enough profit, so we put both manufacturing development and the other development under one executive, Michael Hunt — and he now can shift resources across the two lines.

Then that group of executives left in response to the reorganization?
That's correct.

Were any of these people laid off?
We knew they wouldn't like it when we did it, but we had to take strong action. So, we made these decisions and lots of times there's no place for someone. So, some were [laid off], some weren't and some left on their own.

But someone like Dennis, who had been with me for 17 years, just didn't want development.

In terms of additional streamlining, will there be further cutbacks in personnel?
You never say never. But in this particular instance, there won't be any major layoffs. There will be people leaving and we're hiring at the same time.

How would you characterize this period of time for MSA in its overall history?
This is our 25th year in business and in those 25 years, we've had four bad years financially. This is break even — this isn't as bad as when I took over the company.

Both strategically and growth-wise, it was a sensational year for us. . . . We still spent $64 million in research and development, and we didn't cut it. However, we continued to do all the development necessary to keep us ahead of the game. How would I coin it? I would say it was good and bad.

Is there a particular message you'd like to get across to customers if the recent events have caused them concern?
The key thing is that we streamlined the organization to better serve them, so that anyone within MSA can service any request that comes along. That should cut some red tape that we had developed in the separate organizations.

In terms of all the R&D money that has been spent, what is the status of MSA's entry into the VAX marketplace?
We made the acquisition of Information Associates [a higher education software supplier], and 50% of their revenue comes from the VAX market, [thus] leading us into the VAX market very strongly. That's been the major area in which we have been working with DEC [Digital Equipment Corp.].

You will see us, as time moves forward, putting more on the VAX. But beyond the Information Associates situation, there's nothing, or no product announcements yet.

Are the mainstream MSA applications on the VAX yet?
No, they aren't available on the VAX.

A second area to discuss is manufacturing applications. There is RTS, Comserv Corp. and MSA mainframe applications as well. How is all of this coming together? Is there any level of integration at this point or are you targeting different markets.
The RTS product is used mainly in the international marketplace in mid-range areas. It's designed for small manufacturers and it has been sold very sparingly in the U.S. on a few specific accounts. The Comserv and original MSA products are being developed in tandem to come up with this super manufacturing product.

So the combination of the two are put together, and we are working to come up with a series of products for process manufacturing or repetitive manufacturing. A great deal of integration has already been done on new releases of Amaps [manufacturing software], which is the product out of the Comserv group, with MSA's financials.

In the long term, the initial MSA products in manufacturing and the Comserv products are coming together.

Update us on IBM DB2 support. General Ledger and Information Expert [MSA products] with DB2 support have been in beta-test phase, right?
We have installed a production General Ledger system with DB2 support installed at a couple of customer sites.

Is the plan to provide DB2 support for all MSA applications?
Absolutely. As the world goes DB2, the commitment will be very strong to DB2.

What's the status of your effort to comply with IBM's Systems Application Architecture (SAA)?
As the SAA world progresses, we'll be right there with it. We're right on top of it. DB2 is already part of it.

Has MSA committed to the IBM mid-range follow-on, called Silverlake?
We've signed some nondisclosures; that's all I can say. I think I put up my wife and children with it.

Problem: No end in sight to the growing need for more DASD storage space.

Solution: BIM-PACK

DOS/VSE Automatic VSAM File Compression

Using BIM-PACK will result in:

- Dramatic reductions in disk space requirements, 35% to 70% is typical.
- Faster retrieval when reading a file sequentially.
- Reduction in channel contention.
- Reduced backup time and the number of tapes used.
- Performance improvement in KSDS file access, due to a reduction in index levels and index records.

BIM-PACK is priced at $8,000 for a permanent license, $4,000 on an annual lease, or $400 on a monthly rental. Based on the potential disk space savings BIM-PACK should pay for itself over and over again.

B I Moyle Associates, Inc. has been dedicated to providing cost effective software solutions, which improve system performance and user productivity, for ten years. For additional information on BIM-PACK or any of our other quality software products and services call Jim Kingsbury today.

BIM

B I MOYLE ASSOCIATES, INC.
5788 Lincoln Drive
Minneapolis, MN 55436

612-933-2885
Telex 297 893 (BIM UR)

Member Independent Computer Consultants Assn.

Babcock

CONTINUED FROM PAGE 25

IBM has had little cause to be self-congratulatory about its software once it gets beyond operating systems and utilities. But with DB2 2.0, it has advanced the state of the art of relational data base.

To a great extent, IBM's Feb. 16 announcement of ESA/370, an extension of the MVS/XA operating system, was spadework for a later DB2 announcement. By expanding the capability of virtual memory from 2G bytes to 16 terabytes for data and creating new forms of operating system-controlled CPU memory, such as hyperspace, IBM has created room for radically improved relational data base performance.

"ESA positions us for very huge processor storage," Gary J. Ferdinand, DB2 product manager, noted last week. As an increase is realized in both real memory and expanded storage — the internal memory reservoir under the control of the operating system's paging supervisor — "DB2 can use just about every byte you can throw at it," Ferdinand added.

Granting wishes

Thus, IBM appears to have taken a giant step in the direction of satisfying what, until now, has been an academic wish that unlimited memory inside the processor be put at the disposal of a relational data base management system.

Such a move will not free a mainframe user from all constraints. On the contrary, warns ESA advocate Anthony Deakins at Auxco Consulting, it raises new problems as well as possibilities.

> "DB2 CAN USE just about every byte you can throw at it."
>
> GARY J. FERDINAND
> IBM

Trying to manage the data of large data bases when it is frequently in motion between disk and DB2 buffers raises new exposures. Trying to update a data base of several million records while operating in real time creates new risks.

In addition, ESA and the 3090E processors represent the most expensive products in IBM's stable. Customers would be well advised to look not only at how much work they can do with DB2 but also at the price per transaction.

Nevertheless, IBM has succeeded in pushing back the limits of relational DBMS operation on several fronts at once. It appears the door will open one day to the use of DB2 for multiprocessing work. As Paul Hessinger of the Computer Task Group has suggested, IBM can work on tying each processor in a multiprocessor machine to a separate DB2 buffer and multiply transaction throughput accordingly.

There is a second shoe that will drop before the ESA saga fully unfolds and that is the IBM repository. An application development system based on an introductory IBM repository, it could offer tools to speed the development of DB2 applications. With the ease-of-development capabilities already offered by relational systems — the programmer does not have to define where the data is — a repository and DB2 combination could begin to attack the application backlog at some of IBM's largest customers.

Babcock is Computerworld's senior editor, software & services.

Nastec links CASE

CONTINUED FROM PAGE 25

software development cycle to the coding and testing, or back-end, phases. The former is represented by Nastec's Designaid multimodular system, the latter by the Oakbrook, Ill.-based, Pansophic Telon, which supports IBM's CICS, IMS/DC or batch environments and includes a facility for defining program characteristics, a generator that produces native Cobol or PL/I source programs and an integrated testing facility.

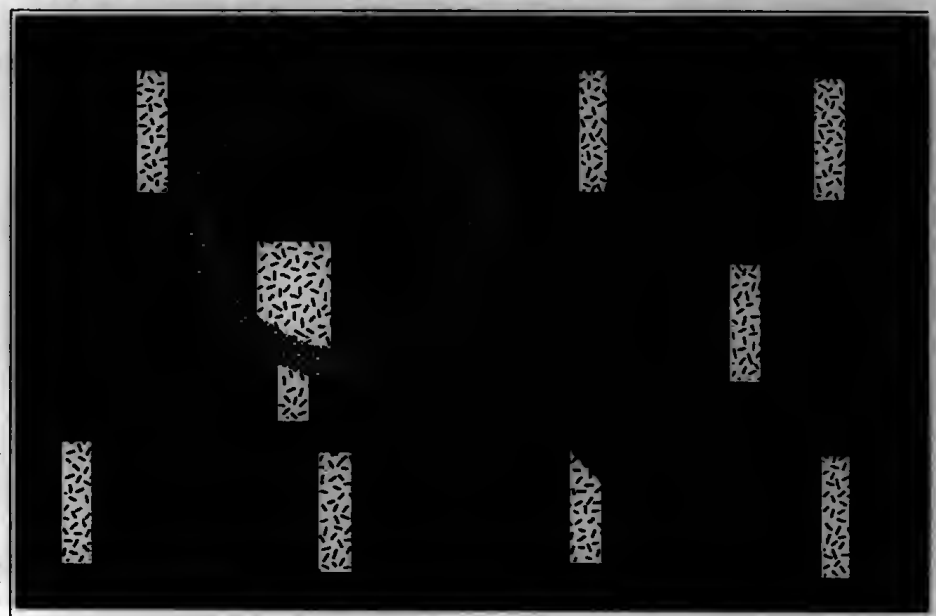
Conversion into Telon

The Designaid/Telon united system, which runs on IBM PCs and compatibles and IBM mainframes, converts user-created Designaid screens and reports into Telon "panel definitions," merging them into specification documents for analysis and review, according to Nastec.

Because the screens and reports become source code in Telon, the interface automatically decreases redundancy, which in turn cuts down the error potential, a company spokeswoman said.

While the majority of the information flows from Designaid to Telon at this stage, the interface is a two-way street with which the user can bring screens back into Designaid for updating of specifications. "And this is just the beginning," said the spokeswoman, who confirmed that Nastec is already at work enhancing the interface, particularly in increasing the two-way aspect.

The Telon Interface Option is available immediately at a site license price of $9,900.



Quality Checker.

VERIFY™ is a powerful QA testing tool that lets you deliver reliable, high performance CICS systems and applications time after time. It automates new or modified system and application testing, from simple program tests to the most complicated stress testing.

With VERIFY, you enter test data only once. The automated logging function permanently stores screen dialogues on a file. You can then browse and customize your test stream dialogues with a variety of powerful on-line edit and utility functions. VERIFY is then ready to retest any portion of your system, giving you the flexibility to control the application mix, input values and arrival rate of the transactions to be re-executed on CICS.

Through an on-line menu display, you can see the exact differences VERIFY discovers during its interactive comparison. And respond immediately with two full menus of mismatch processing options.

In addition, VERIFY provides several levels of in-depth security for your data, with options like dark field protection and test stream protection. VERIFY works with 3270's, 3600's, 4700's, TWX's, and most other devices.

VERIFY. It helps you get it right the first time. Call today to start your 30-day product trial or for more information on VERIFY. Reseller programs available. On-Line Software International, Inc., Two Executive Drive, Fort Lee, NJ 07024.

800-642-0177
In Canada, 416-671-2272/Europe, 44-1-631-3696

On-Line Software International
Authorities in IBM® Software

VERIFY. *The Leading Quality Assurance/System Testing Tool.*

IBM is a registered trademark of International Business Machines Corporation.

NEW PRODUCTS

Applications packages

An optical document recognition system said to capture document structure as well as ASCII characters and page layout has been announced by **Context Corp.**

The **Document Recognition Solution Pack** includes the vendor's Network Recognition Engine hardware driven by the ScanED software application. The recognition capability includes text, pictures, page layout and structures like sections and lists.

Other features include omnifont performance for more than 20,000 font sizes ranging from six to 28 points. Scanning speed is 250 recognized char./sec., the vendor said.

The Document Recognition Solution Pack is priced to $38,000. It will be available in the third quarter.

Context, 8285 S.W. Nimbus Ave., Beaverton, Ore. 97005. 503-646-2600.

Utilities

A utility said to speed the process of converting files from Cobol to Speed II, Tom Software's fourth-generation language for Wang Laboratories, Inc. VS computers, has been announced by **Tom Software, Inc.**

Lexigen automatically creates Speed II data dictionary records from information contained in the select and record definition portions of Cobol source code programs.

Lexigen is a menu-driven system featuring a program that automatically searches the system for any Cobol source code programs and creates a cross-reference file that includes all Cobol file names referenced in those programs, the vendor said.

Other features include error checking and a log of the conversion process.

Lexigen carries a price starting at $1,500.

Tom Software, 127 S.W. 15th St., Seattle, Wash. 98166. 206-246-7022.

A disk management tool for IBM DOS/VSE-based systems, said to provide automatic data compression for VSAM files, has been announced by **Universal Software, Inc.**

VSAM-Lite is a table-driven system that does not require any program or IBM JCL modifications. The user specifies the data sets to be compressed, and VSAM-Lite automatically and transparently does the compression, the vendor said.

Features include elimination or postponement of direct-access storage device upgrades; improved system performance and on-line response time; reduced disk I/O activity and channel contention; and improved backup and restore processing and backup tape use.

VSAM-Lite costs from $7,250 for a permanent license.

Universal Software, Brookfield Office Park, Brookfield, Conn. 06804. 203-792-5100.

Development tools

Two C compiler packages designed to assist users of Versados to migrate development to Unix System/68 on Motorola, Inc.'s 11/31 have been announced by **Whitesmiths, Ltd.**

The first package provides a native C compiler for System/68; the second provides System/68 hosted C cross-compiler support for Versados. In addition to Whitesmiths' standard Versados C native compiler, support is provided for all of Motorola's 68K-byte-based operating systems. Both packages provide support for stand-alone code production for embedded systems.

The C Cross Compiler costs $3,000; the System/68 C Native Compiler costs $1,500.

Whitesmiths, 59 Power Road, Westford, Mass. 01886. 617-692-7800.

A family of knowledge-based environments designed to facilitate the development of applications that extend SQL relational data bases has been announced by **Quantum Inknowvations Corp.**

The **Progenesis** family operates as an expert front end to such relational data base management systems as IBM's DB2, Oracle Corp.'s Oracle and Sybase, Inc.'s Sybase. It provides transparent access to SQL relational DBMS systems, integrated use of local-area networks, knowledge-based reasoning and windowing user interfaces.

Progenesis is priced from $895 to $4,995. Runtime versions are also available.

Quantum Inknowvations, 2953 Bunker Hill Lane, Santa Clara, Calif. 95054. 408-496-6933.

An automated Ada-based analysis tool called **Adamat** has been announced by **Dynamics Research Corp.**

According to the vendor, Adamat uses more than 150 Ada-specific metrics. Adamat provides a detailed analysis of Ada source code. It also provides users with tools for monitoring project progress and pinpointing problem areas at any stage in the development process.

Adamat runs on Digital Equipment Corp. VAX and Microvax computers. Prices range from $2,495 for a Microvax II or 2000 to $34,985 for a VAX 8978 or 8974.

Dynamics Research, 60 Frontage Road, Andover, Mass. 01810. 617-475-9090.

WHY DO SEVEN OF THE "BIG EIGHT" ACCOUNTING FIRMS CHOOSE REALIA COBOL?

Why Realia? Simple. Because we can help the best *stay* the best.

Realia COBOL is the fastest, most advanced application development tool available to bring the power of the mainframe right to your PC. You'll start saving time, money, and resources, whether you're maintaining an old system or creating a new one.

Realia COBOL offers your programmers the quickest compilation and the biggest file capacity of any PC compiler. A 10,000-line program compiles in 76 seconds. A 10,000-record sort takes 43 seconds. Best of all, Realia-compiled programs execute faster than any other PC compiler's. With RealCICS®, you can even handle online CICS programs.

At Realia, we also offer you something that has become a bit of a contradiction in terms: genuine support for a micro software product.

Realia COBOL—simply the best choice.

REALIA®

10 South Riverside Plaza, Chicago, IL 60606 • (312) 346-0642 • Telex 332979

MICRO BITS

Douglas Barney

Why the long wait?

Did it have to take so long? Recent speculation that IBM and Microsoft's OS/2 Presentation Manager may not meet its October delivery deadline and the realisation that most of the applications for the interface aren't even being written yet make some users' blood boil. But to get really steamed, just think of the way it might have been.

Knowledgeable software developers claim this whole wait-and-then-wait-some-more situation could have been averted and that Microsoft Windows applications could be running under OS/2 today. That is, were it not for IBM.

Developers say Microsoft's original plan was to port Windows as quickly and smoothly as possible over to OS/2 and have that serve as a graphical front end. Since this was the plan, Windows developers were told that their applications would be automatically OS/2 compatible. Yup. If this had happened, current Windows applications would be running on OS/2 today.

Instead, IBM traded its endorsement of Windows for the right to redesign the code-un-

Continued on page 46

Few users speeding to OS/2

Dearth of applications, looming customization ward off PC managers

BY ALAN J. RYAN
CW STAFF

NEW YORK — OS/2 implementation is progressing at a snail's pace due to the lack of applications and the daunting support requirements, according to PC managers at the recent Microcomputer Managers Association meeting here.

An overwhelming majority of managers attending a session entitled, "OS/2: Who needs it?" replied, "No one."

The managers cited the lack of applications written for the operating system as one reason for holding off their OS/2 purchases. However, some said they fear losing their independence by switching to OS/2. Because OS/2 must be extensively customized for each brand of PC, there is only one source for the operating system.

Others said they are considering OS/2 but have not ruled out alternatives like Unix, which also provides large memory addressing and multitasking. Unix will also support a graphical user interface when Open Look from Sun Microsystems, Inc. and AT&T arrives.

The personal touch

Customization is one aspect of OS/2 that many users have not considered.

Paul Mace, president of Paul Mace Software, Inc. in Ashland, Ore., said many users do not realise that with OS/2 they may be forced to customize their software and hardware. "You've been accustomed to buying off-the-shelf software and hardware, but that won't necessarily be possible in the future," he said.

Making those packages work together is the problem. "Users will need either inside or external support to tie it all together," Mace said. He added that by bringing out OS/2, IBM is trying to control the PC revolution, which until now has been fueled by user wants and needs.

"This goes back to 20 years ago," one audience member said. "Users won't have independence with Unix or OS/2." This criticism was raised even

Continued on page 40

Ampro tool burning up

BY ALAN J. RYAN
CW STAFF

SUNNYVALE, Calif. — Forget floppies. Forget hard drives. Burn that software into read-only memory (ROM). At least that is what Ampro Computers, Inc. hopes MIS professionals will do with the firm's new utilities package for embedding software into any Ampro Little Board/PC.

But do not unhook your disk drives yet. The Ampro system is intended primarily for use in harsh environments, where floppies die as fast as fruit flies. Typical applications include point-of-sale terminals, industrial control systems, remote data loggers

Continued on page 46

Data View

Training places

Less expensive, on-site training methods are used more often than costly off-site methods, according to 2,500 systems professionals

INFORMATION PROVIDED BY THE ASSOCIATION FOR SYSTEMS MANAGEMENT

DEC hookup lures techies to Apple fold

BY JULIE PITTA
CW STAFF

CUPERTINO, Calif. — One result of Apple Computer, Inc.'s well-publicized alliance with Digital Equipment Corp. may be a greater acceptance of Apple's Macintosh by technical users.

Even before its joint development agreement with DEC, Apple had a devoted following of engineers who had taken to its graphical user interface. However, many engineers have used the Macintosh computer for general purposes, rather than for more sophisticated technical applications.

Apple's union with DEC — which boasts a formidable presence in engineering environments with its VAX minicomputer — lends credence to the

Continued on page 40

Inside

- Peat Marwick's MIS boss savors Apple. Page 33.
- Pioneer package blazes data base trail. Page 36.
- Quology adds ruggedised AT compatible. Page 48.

CICS DL/I is the latest addition to Micro Focus COBOL/2 Workbench!

Create new CICS DL/I applications or maintain your old ones with the CICS and DL/I options for Micro Focus COBOL/2 Workbench™ on your IBM® PC/AT® or PS/2® and get all these benefits:

- Eliminate turn-around delays of DBD, PSB, and BMS generations
- Instant response time
- Minimize SMF TSO/BTS job charges
- Prototype CICS and DL/I applications easily
- Minimize CICS and DL/I control region abends
- Put mainframe resources on your desktop
- Compile, link, and test programs in minutes

Look at these DL/I features:

- "CBLTDLI" call support
- BLL Cell support
- Pointer variable support
- GSAM
- Secondary Indices
- Complete SSA processing
- All SSA Command Codes
- Adherence to DB positioning rules
- Message switching
- Exact PCB feedback (Status Code, Key feedback and length, Segment Name and Level, etc.)
- PCB status reporting
- DBD and PSB macro assembly
- Query/update DB utilities
- BTS-like trace facility for calls to "CBLTDLI"

New with PC-CICS 2.0:

- CICS Release 1.7 FORMATTIME and EIBRESP response code support
- READPREV, ADDRESS, and SEND CONTROL commands
- ADDRESS command support of CWA, TWA, and TCTUA

PC-CICS already supported the major requirements for developing and testing CICS programs on a PC. Including the following:

- VS COBOL II and OS/VS syntax support
- BLL Cell support
- Pointer variable support
- BMS support
- VSAM KSDS files

Compile and Run Huge Programs:

If your CICS DL/I programs are large, you can handle them with COBOL/2 Workbench's unique 32 bit architecture and the Micro Focus XM™ memory extender. Programs with Data and Procedure Divisions of up to 16 MB may be run on an AT or PS/2 in protected mode.

For the most efficient development of either your PC or mainframe programs, call us now.

1-800-872-6265

US: 2465 E. Bayshore Road
Palo Alto, CA 94303
(415) 856-4161

UK: 26 West Street
Newbury, Berkshire RG13 1JT
(0635) 32646

MICRO FOCUS®

A Better Way of Programming™

®IBM is a registered trademark, PC/AT and PS/2 are trademarks of International Business Machines Corporation

IF THE REASON YOU HAVEN'T BOUGHT A 24-PIN PRINTER IS PRICE, YOU'VE LOST YOUR REASON.

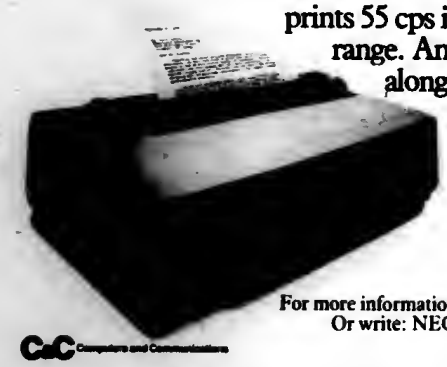
You've also lost your last reason for buying a 9-pin printer. Our new Pinwriter® P2200 dot matrix printer is the first 24-pin printer that is priced lower than many of today's 9-pin printers.

However, we didn't strip the price by doing the same thing to features. In fact, we gave the P2200 a few features you won't find on any other printers at any price.

AVAILABLE FOR UNDER $500.

Like more software support than any other 24-wire printer and unrivaled paper-handling capabilities. It feeds from both the rear and the front. And you can print a single sheet without removing your continuous paper. You can also produce up to 128 type variations within a single document.

We also didn't get the price down at the expense of speed. The P2200 prints 55 cps in LQ mode – that's faster than any other printer in its price range. And in draft mode, it speeds along at 170 cps.



So see your NEC dealer today. Anything else would be thoroughly unreasonable.

NEC PRINTERS. THEY ONLY STOP WHEN YOU WANT THEM TO.

NEC

For more information, and the name of the NEC IS dealer nearest you, call 1-800-343-4418 (in MA 617-264-8635). Or write: NEC Information Systems, Dept. 1610, 1414 Massachusetts Ave., Boxborough, MA 01719.

C&C Computers and Communications

SMALL TALK

William Zachmann

Toss out big iron

It was in 1964 that Bob Dylan wrote, "The times, they are a changin'." It was also in 1964 that IBM introduced the 360 mainframe architecture that has, since then, dominated computer use in large organizations.

We are presently at the threshold of an equally dramatic period of technological change. Traditional mainframe and minicomputer architectures — the most successful of which have been the IBM 360 and 370, introduced 24 years ago — are as surely doomed today as were the dinosaurs 65 million years ago when, some say, a meteorite struck the earth and altered the climate.

The personal computer revolution that has swept the industry during the past seven years is just the tip of the iceberg. The real action is just beginning, and it will ultimately result in the replacement of traditional mainframe and minicomputer systems with microprocessor-based alternatives.

While it is microprocessor technology that makes this transformation possible, it is economics that makes it inevitable. Computer professionals, from programmers and analysts right on through senior information systems managers and

Continued on page 43

Peat Marwick MIS boss took early shine to Apple, now reaps a bumper crop

A self-proclaimed Macintosh "bigot," Peat, Marwick, Main & Co.'s Richard Webb was one of Apple Computer, Inc.'s earliest MIS fans. As partner in charge of Peat Marwick's audit technology, Webb was instrumental in purchasing Macintoshes as early as 1983, when most MIS professionals dismissed the Mac as no more than a toy, lacking the power and sophistication to be a business tool.

Neither Webb nor his firm have regretted what others may have considered a risky decision to go with Apple. In the first four months of this year, Peat Marwick has already purchased another 500 Macintoshes. And Webb watches approvingly as other corporations increasingly buck tradition and opt for Apple over IBM.

Recently, Webb, a 20-year MIS veteran, spoke to *Computerworld* West Coast senior correspondent Julie Pitta about the advantages he perceives in Macintoshes and his early days as a Mac proponent.

Webb likes what he sees *in the Mac's future but won't rule out other PCs*

When you first brought the Mac into Peat Marwick, did you encounter any resistance from within the firm?

Virtually the entire operating committee of the firm was involved in making the decision to go with the Macintosh. At that time, we were comparing it to the IBM Personal Computer and the Hewlett-Packard Touchscreen PC. Fortunately, we had a lot of good support from people outside the audit department who felt the analysis we did at the time was objective.

When did the Macintosh first come into Peat Marwick? Why did you buy it?

The first two we got were in April of 1983. We announced we were going to buy it when Apple announced the product in 1984. Our first order was for 3,500 machines. In 1987, we bought 2,000 machines.

We actually decided on the Macintosh in May of 1982, when all we were buying was specifications.

We knew Apple was relatively new, but it had a means of servicing us wherever we did business. And of course, cost was important. But that was last on the list. The user interface was the No.1 differentiator.

I always get my dander up when people say it is a toy. When

Continued on page 42

Clipper saves time, lives at bone marrow registry

BY ALAN J. RYAN
CW STAFF

ORADELL, N.J. — Saving lives is the name of the game at the New Jersey Human Leukocyte Antigens Registry, which matches bone marrow donors and recipients. For the registry, saving time can translate into saving more lives, which led to an ongoing search for faster data base software and processors.

The registry was formed in late 1986, and things soon becoming hectic when the donor pool reached 500. A bit of computer automation was desperately needed, according to Elie Katz, president of the registry.

To speed the matching of donors and patients, Katz and a friend first wrote a program in Ashton-Tate Corp.'s Dbase II. The program, running on an Intel Corp. 8088 microprocessor-based personal computer, included the key factors that must be met to match a donor with a recipient. For instance, a donor's marrow must match six antigens in order to be considered.

"If you think of the quantity of capabilities, it became quite tedious. We had 500 donors and 400 patients. It took 3½ to four weeks to do matching for them," Katz said. The registry's system was eventually converted to Dbase III.

Needed some speed

With the size of the donor and patient pools growing daily, Katz needed a faster matching system. Steven Dunn of Custom Software Development in Englewood, Colo., suggested Clipper, a Dbase compiler from Nantucket, Inc. in Los Angeles. Katz decided to take a look at it.

Because the registry is a charitable foundation, with funding generally spent on tissue typing, Katz called Nantucket directly and asked for a complimentary copy of Clipper. It was quickly sent.

In February, Katz sent the source code of his program to Dunn, who compiled it with Clipper. "When we put it together, our matching program went from 3½ weeks to 18 hours to finish everything," Katz said.

"It translates into better

Continued on page 40

Alpha/3 brings Dbase format to common man

BY DOUGLAS BARNEY
CW STAFF

When Dave Garcia evaluated four data base software products, he chose not one, but two packages. Making the first choice was almost too easy. As a technically oriented end user at magazine publisher Diamandis Communications, Inc., he gave Ashton-Tate Corp.'s market-leading Dbase III high marks. But for those less skilled in the ways of data base programming languages, he picked Alpha/3 from Alpha Software Corp.

Unlike Dbase and other high-end data base packages, Alpha/3 is fully menu-driven and has no programming language. Despite these absences, the product can still do a decent job manipulating and tracking data, users said.

Perhaps the product's biggest selling point is that it uses the Dbase file format, so those with Alpha/3 can use the same disks as the technical people who hammer away at Dbase.

Alpha/3 competes with Software Publishing Corp.'s Professional File, Symantec Corp.'s Q&A and Ashton-Tate's Rapidfile. Of these products, however, Alpha/3 is the only one that uses the Dbase file format. The others rely on file import and conversion.

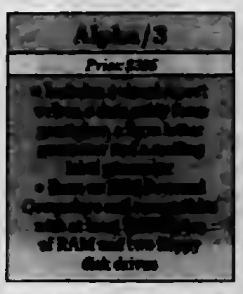
Icing on the cake

For Garcia, the file format closed the deal. "We chose Alpha/3 because it uses the Dbase file format," explained Garcia, who serves as a personal computer analyst for Diamandis.

Now Diamandis users can generate mailing lists and manage contacts without ever seeing the dot prompt so central to Dbase. In fact, *Popular Photography Magazine*, published by Diamandis, uses Alpha/3 to manage a mailing list of 600 names. Even for more complex applications, Garcia avoids throwing Dbase at the users' feet. "Instead, we will design a Dbase application for them."

For Tom Cancillo, the ease of use combined with Dbase file compatibility made Alpha/3 the package of choice. "We have 40 PC users in our department, and most are not experts," said Cancillo, supervisor of automation at PPG Industries, Inc.

Despite the lack of programming, Alpha/3 is not used for lightweight applications. Already, PPG users have some 30 to 40 Alpha/3 applications that do everything from tracking retirement benefits to keeping



tabs on the income of overseas employees. "We used to use Dbase III, but since we have Alpha/3, we don't anymore," Cancillo said.

It was elementary economics that led Security Pacific Information Services, Inc. to hook onto Alpha/3. "We have a large user community and a small support staff," explained Teresa S. Young, a programmer and analyst at Security Pacific. "We have a lot of need for data bases but lack the skills, resources and money to have applications written in Dbase."

While Alpha/3 does a lot of jobs for Security Pacific, it is not the ultimate solution to all problems. "If Alpha/3 doesn't offer what we need, we use Dbase as a back end," Young said.

Alpha/3 may be good, but no software is bug-free. Cancillo has run across some pesky problems with Alpha/3. One in particular is the way the package handles the computation of intermediate fields. If an intermediate field is included in another computation, the program may lop a couple of digits off the final result. Instead of fixing the bug in the next release, Alpha/3 is focusing on converting the flat-file manager into a relational product, one user said.

We Think Bey

Meet Memorex Telex.

Of course, our products come in boxes, but there's nothing packaged about our thinking. We find creative solutions by thinking beyond the proverbial "box". Standard solutions just aren't up to our standards.

We've got more to offer than an extensive product line. We've got the best dedicated sales and service groups in the industry. And if the right product for your system *isn't* in our line, we'll source it for you and plug it in.

We give you added value in 3270, S/3X, PBX systems, voice-data equipment, airline terminal products, information storage equipment,

© 1988 Memorex Telex

ond The Box.

intelligent workstations and computer supplies.

Part of that added value is our 2000 satellite-linked U.S. customer engineers, available 24 hours a day. Another part is expanded leasing and brokerage options.

Creative solutions don't come in boxes – they come from people who work hard for your business. Us. To hear more about our way of thinking, call 1-800-331-2623, ext. 4530 (in Oklahoma, 1-918-624-4530).

MEMOREX TELEX

Citizen adds AT compatible

BY SALLY CUSACK
CW STAFF

SANTA MONICA, Calif. — Formerly known only as a printer and peripherals outfit, Citizen America Corp. last week plunged into the IBM Personal Computer AT-compatible waters.

Christened the Citizen Mate/12, the firm's new system is positioned in the mid-range compatible market, competing primarily with Epson America, Inc., AST Research, Inc. and Wyse Technology, Inc. personal computers.

The Citizen Mate/12 marks the firm's first foray into the PC market.

According to Michael Del Vecchio, senior vice-president of sales and marketing at Citizen, the product's somewhat unique motherboard capabilities offer potential savings for MIS. Del Vecchio said, "Cost effectiveness is achieved by adding chips to the motherboard instead of adding cards to the system."

Priced from $2,149, the Intel Corp. 80286-based, 12.5- or 6.25-MHz system is available in three models. Citizen Mate/12 includes 1M byte of random-access memory.

Four expansion slots and Microsoft Corp. MS-DOS 3.3 are included with the system, and a mouse comes standard.

Two fresh views on the use of PC data bases

Innovative ways of probing existing data bases have been announced by Pioneer Software Systems, Inc. in Raleigh, N.C., and Pantheon-Delphic Systems, Inc. in Belmont, Calif.

The $129 Pioneer package, called Q&E, is based on the Microsoft Corp. Windows graphical interface and can be used to query and edit Ashton-Tate Corp. Dbase or compatible files. The system provides ad hoc and stored-query capabilities and a full complement of editing functions, such as deleting or adding records and updating fields.

Q&E is also being ported to work with data base management system products from Oracle Corp. and the SQL Server from Ashton-Tate and Microsoft.

Pantheon has set its sights on more than Dbase. In fact, the Pantheon Development and Delivery System allows MIS to build a general interface to products built on either the hierarchical or relational models. As a result, end users can be shielded from the syntax of particular data base systems.

The Pantheon system includes several components; the $4995 Pantheon Developer, the $495 Delivery System, an ad hoc system for $895 and a tool kit that provides access to the Pantheon data base engine for $1,195.

Portable hard disk from Plus

BY JAMES A. MARTIN
CW STAFF

MILPITAS, Calif. — Removable hard disk drives that are said to be transportable between older IBM Personal Computers and compatibles and the the newer IBM Personal System/2 models were announced last week by Plus Development Corp.

The Plus Passport hard disk, available in either 20M- or 40M-byte capacities, is a self-contained, 3½-in. Winchester disk drive encased in plastic. The systems are reportedly compatible with the IBM PC XT, AT and all PS/2 models.

The Plus Passport was designed to ease data exchange between PCs and PS/2s, but it is also aimed at users in need of data security and hard-disk expansion, Plus said. The primary markets targeted are government, banking and finance.

"Plus has done a beautiful engineering job and has addressed nicely the needs of users who want removable drives that can survive the rigors of transit," observed Robert H. Katzive, vice-president of Disk/Trend, Inc., a data storage consultancy in Mountain View, Calif.

The Plus Passport must vie for attention with the Iomega Corp. Bernoulli Box, an external system with removable hard-disk cartridges for IBM PCs and compatibles, and Tandon Corp.'s Personal Data Pac technology, removable hard disks for Tandon microcomputers. In addition, the product must compete with an increasing array of high-capacity floppy disk drives from companies such as Data Technology Corp., Eastman Kodak Co. and Konica Technology, Inc.

A complete 20M-byte Passport kit for the IBM PC will retail for $1,250, with an IBM Micro Channel version costing $1,350. A 40M-byte kit costs $1,450 for the PC and $1,550 for the Micro Channel.

Additional media, however, will run $595 for 20M bytes and $795 for 40M bytes. "Since the media unit is the price of a whole drive, it would be pretty costly to build a hard-disk library with this product," Disk/Trend's Katzive said.

Passport is scheduled to begin shipping in June and will fit into a 5¼-in. hard-disk slot.

To Connect With Compaq, Go Through Businessland.

Integrating the lightning-fast COMPAQ DESKPRO 386/20™ and the COMPAQ PORTABLE 386™ into your local area network is a very effective way to increase office efficiency and productivity.

For starters, they're the fastest PCs on the market today. The COMPAQ® cache memory controller provides a 25% increase in performance over other 20-MHz 386 PCs. Plus its unique disk caching ability decreases access time.

Another benefit is flexibility. With Novell® NetWare,® you can change a workstation into a high-performance network server. Which means you'll get the most out of all your other systems, too.

Networking your office with COMPAQ products is relatively easy, when you go through the experts at Businessland.® After installing over 6,000 local area networks for some of the nation's largest corporations, you can be confident that we know the right connections.

BUSINESSLAND
NETWORKING SEMINARS

To learn more about networking, you can go through Businessland, too. Call 1-800-328-8383 for more information on the seminars in your area.

Work Group Networking—All the basics of planning a network.

PC and Mac Communications—The how's and why's of connecting PCs and Macs to mini's and mainframes.

Connectivity—Systems engineers discuss how the latest technology affects your network.

BUSINESSLAND.
A Different Kind of Computer Company

Trademarks/owner: COMPAQ DESKPRO 386/20, COMPAQ PORTABLE 386, COMPAQ-Compaq Computer Corporation Novell, NetWare/Novell, Inc. Businessland and the Businessland logo are registered trademarks of Businessland Inc.

Some companies make workstations for just about anyone.

We engineer ours onl with a passion for per

While some companies sell a lot of computers because they make something for everyone, we sell a lot because we don't.

All the workstations we make, the applications that run on them, and the networking power that unites them with the other computers in your company were created for a select group of people.

Namely the engineers, product designers, software developers and other professionals who demand nothing less than ultimate compute performance.

People who clamor for access to processing power and graphics. Who possess an insatiable appetite for information. And who can ill afford to endure the delays, limitations and obstacles that typically hinder the effort to attain it.

If you're such a person, you should have an Apollo workstation. For you'll realize the moment its screen is in front of you that the issue of performance is behind you.

An Apollo workstation will grant upon you enough dedicated compute power to keep your imagination charged permanently. Letting you choose from a compatible family of workstation systems whose prices start as low as a personal computer and whose per-

y for those formance.

formance extends to that of supercomputers.

These machines will grant you imagery so brilliant you won't want to blink for fear of missing something. With real time two- and three-dimensional graphics that render up to 16.7 million colors at 130,000 vectors per second. And they'll open your eyes even wider with networking power and elegance.

Every Apollo workstation, from the Series 3000™ Personal Workstation™ to our new Personal Supercomputer,™ functions as a command center from which you have unequalled access to data, processing power, development tools, and applications. So that every mainframe, minisuper, and microcomputer on your network is at your beck and call.

In a manner almost invisible to you, our workstations show you networking performance you probably thought impossible.

For with the industry's first implementation of Network Computing Architecture,™ they make your multi-vendor network appear as one computing environment.

Letting you run a single application on a network of computers by automatically dispatching portions of a program to the processors most qualified to execute them. And providing the tools to develop and debug code running on different machines.

All while freeing you to create applications, access network resources and even move from one operating environment to another with whatever language, menus and file names you define.

A fact that might inspire you to wonder if we don't engineer our workstations only for you.

Today, there is more than one way to measure computer performance. But when the criteria include processing power, graphics and network computing, nothing measures up to Apollo.

apollo

For more information, call 1-800-323-1846 In Massachusetts call 1-800-847-1011 Or write Apollo, 330 Billerica Road, Chelmsford, MA 01824

Apollo is a registered trademark and Series 3000, Personal Workstation, Personal Supercomputer and Network Computing Architecture are trademarks of Apollo Computer Inc

DEC hookup

CONTINUED FROM PAG

Macintosh, industry watchers said recently. It also broadens the recognition of a natural synergy between the Mac and the VAX.

"It used to be kind of taboo to use the Macintosh for computer-aided design [CAD] applications," said David Burdick, an industry analyst at Dataquest, Inc.

Sophisticated use encouraged

The agreement with DEC represents only the latest argument for engineers to use their Macintoshes for more than writing memos or compiling spreadsheets.

With the introduction of the Macintosh II a year ago, Apple offered technical professionals a powerful platform based on the Motorola, Inc. 68020 microprocessor. The firm also finally assented to an open architecture allowing the addition of graphics boards for engineering applications.

Dataquest's Burdick said the Mac II has captured the attention of independent software developers, such as Versacad Corp. and MacNeal-Schwendler Corp., specializing in engineering packages. More are expected to follow, he added.

"The Mac II generated a lot of excitement," Burdick said. "Almost all the CAD/CAM software vendors are going through a Macintosh port right now," he added, referring to CAD/computer-aided design.

The availability of widely used engineering packages for the Macintosh should give it a significant boost among technical users.

That is already starting. In 1986, Apple shipped 8,000 Macintoshes worldwide for use in CAD/CAM. That figure jumped to 38,000 units worldwide last year. Burdick said he expects shipments of the Mac to those environments to double over 1987 levels by year's end.

Probing markets

To exploit its opportunity in technical markets, Apple established a marketing organization for the engineering and scientific markets nine months ago.

That group six months ago launched an effort to sign value-added resellers servicing technical customers.

"It's a serious commitment for Apple," said Dave Kulbarsh, manager of marketing programs at Apple's engineering and scientific marketing group.

Technical sales up

Apple has estimated that between 8% and 12% of Macintosh sales are now to technical professionals.

Kulbarsh said the Mac offers engineers a balance between a technical tool and a general-purpose system. "Our strategy is that technical professionals spend less than half their time on pure technical applications," he explained.

A single computer on the desk has to do both technical and general office functions, he added.

VSCR Ahead

BMC SOFTWARE

In the U.S., 1-800-841-2031
In Canada, 1-800-231-2698
In Texas and Alaska
call collect, 713-240-8800

BMC Software, Inc. CW
P.O. Box 2002 • Sugar Land, TX 77487-2002

☐ I am interested in a 30-Day-Plus Free Trial of DELTA IMS VIRTUAL TERMINAL

☐ Please contact me with more information on DELTA IMS VIRTUAL TERMINAL

Name _____
Title _____
Company _____
Address _____
City _____ State/Prov _____ Zip/PC _____
Telephone _____

Virtual Storage Constraint Relief is just around the corner when you install DELTA IMS VIRTUAL TERMINAL and significantly reduce your virtual storage demands.

IMS/VS requires a control block in the IMS/VS control region for every IMSGEN-defined terminal in your network. With DELTA IMS VIRTUAL TERMINAL, the only 3270 and SLU2-type terminal control blocks present in storage are for those terminals logged on to IMS/VS.

Now you can stop basing your virtual storage needs on your maximum network size. DELTA IMS VIRTUAL TERMINAL lets you plan your storage needs on the maximum concurrent demand.

- No longer will control blocks for idle 3270 and SLU2-type terminals tie up virtual storage.
- No longer will control blocks for infrequent users tie up virtual storage.
- No longer will control blocks for planned, but not yet assigned, terminals tie up virtual storage.

For more information on DELTA IMS VIRTUAL TERMINAL, or to begin a 30-Day-Plus Free Trial, clip and mail the coupon. Or Call BMC Software.

Speeding to OS/2

CONTINUED FROM PAGE 31

though virtually every major personal computer maker will have its own version of OS/2.

IBM's Mike Maples, director of software business systems at IBM's Entry Systems Division in White Plains, N.Y., pointed out OS/2's flexibility. "OS/2 allows users to do user things when appropriate, work group things when appropriate and corporate things when appropriate."

Unix was also defended. Dale Hazel, at AT&T's Unix product planning department in Summit, N.J. said Unix's level of complexity does not take independence away from users.

The eventual arrival of OS/2 applications could change many minds. Last week, Maples cited a study that found that developers are putting 90% of their resources behind OS/2.

But one user said the statistics do not accurately portray the interest of users. "If software developers are putting 90% of their resources behind OS/2, it's because they're talking to other software developers, not to us. We're not that interested," he said.

Another user criticized IBM for not making an OS/2 version optimized for Intel Corp.'s 80386 microprocessor. Many companies are moving to microcomputers based on the 80386; OS/2 is optimized for the Intel Corp. 80286.

Clipper

CONTINUED FROM PAGE 33

matches more quickly, with the ability to now consider even more factors in the matches," Dunn said.

However, the donor pool continues to expand and has climbed to 1,200. The matching process time has gone up to 2½ days. Katz is now seeking an IBM Personal System/2 Model 80 with a 20M- or 40M-byte hard disk.

"If we get a 386, it will narrow the process down to half a day," he said. "And every time we find a match, we have the capability of saving an individual."

Because the registry is part of the American Association for Bone Marrow Donors, Katz said, he will send the program to the four other sites under that umbrella around the U.S. "It might even go all over the world, because other registries have expressed an interest in it," he said.

Why You Should Consider Not Buying All Your Software From The Same Vendor.

Some large software companies aggressively sell the single vendor idea.

Unfortunately, the benefits of using this approach can be far out-weighed by inconsistent quality and poor integration across a multi-product line. Buying all your software from one vendor may force you to settle for some second-class products.

Unlike many single source or "all-things-to-all-people" vendors, Data Design believes in doing one thing.

And doing it well.

We specialize in truly integrated mainframe financial software.

Period.

Data Design is the only major mainframe software vendor that keeps this focus and resists the attraction of a vastly expanded product line.

By writing every line of code, we assure that Data Design systems are crafted to our own strict standards.

By developing each application from scratch, using the same proven approach, we achieve the level of compatibility that *defines* integration.

By subjecting each system to Data Design's rigorous testing program, we offer products with an extremely high level of quality, consistent throughout our line of financial software.

We believe that quality, reliability, and integration shouldn't be *optional features* of a software system.

They should be built in from the ground up.

For 14 years, hundreds of FORTUNE 1000 companies have reaped exceptional results from our systems. Companies like Alcoa, Burger King, Greyhound, Pillsbury, Bankers Trust, General Electric, Chicago Tribune Company, and Security Pacific National Bank.

In fact, we'll send you our *entire* customer list. Ask *anyone* on it about our fast, trouble-free implementation; system flexibility and ease of use; in-depth training and responsive, knowledgeable support; *management level* people in customer service positions.

And more.

If you're in the market for mainframe financial software, consider the products that are considered the best. Financial software by Data Design.

And if you are now evaluating software for your company, send for a free comprehensive guide designed to make the mainframe software selection process easier.

To learn more, call Betty Fulton toll-free at **800-556-5511**, or mail in this coupon.

Please send me information on the following:

- ☐ GENERAL LEDGER & FINANCIAL CONTROL
- ☐ ACCOUNTS PAYABLE & PURCHASE ORDER CONTROL
- ☐ FIXED ASSET ACCOUNTING
- ☐ PROJECT ACCOUNTING
- ☐ FREE SOFTWARE SOLUTIONS KIT

NAME

TITLE

COMPANY

ADDRESS

CITY, STATE, ZIP

TELEPHONE ( )

COMPUTER BRAND MODEL

CWD

DATA DESIGN ASSOCIATES

Excellence in financial software.

1279 Oakmead Parkway, Sunnyvale, CA 94086

Peat Marwick

FROM PAGE 33

we first made the decision to buy in the Mac in '82, we felt it would satisfy our business needs, and it did. The 128K-byte version was used for almost two years before we went to the [512K-byte] Mac Plus, and it was satisfactory for 90% to 95% of our users.

Our so-called power users felt it didn't have enough power for them. It'a unfortunate it got the label as a toy way back when, because if something'a easy to use, it doesn't get taken seriously.

What were some of the problems you encountered being one of Apple'a first major corporate accounts?

We wanted to be a national account with them; we didn't want to go through dealers, because we didn't think they could support us. One of the advantages we've had in working with Apple was, we created a worldwide support organization and direct it from here.

We order everything from here; we tell Apple where to ship it and bill it. We do of all the software development — in terms of proprietary software development — from here. We tell the vendors to duplicate the disks and where to send them. We develop all the training materials and ship them around the world. We do everything ourselves, and we want to do it that way because we want a uniform way of implementation.

How are purchasing decisions made at Peat Marwick today?

It was very easy at the beginning, because everything that came out we wanted to look at. Now we have to be very picky, because with all that'a out there today, it can absorb all of our time. We get down to fine points — the amount of real estate a machine would take up on a desk, the number of pieces an auditor would need to transport. At the time we chose the Mac, we evaluated technical specifications like a comparison of the 8088 and the 68000 processors; expectated speed of processing; memory. We have one person who does an initial evaluation to screen a product to see if it'a something we even want to consider. Before we decide to purchase a product, we obtain a couple of evaluation copies and have people within my group use it.

Do you feel that Apple is losing its technological edge to IBM?

I think IBM — with OS/2 and the Presentation Manager — has made it more difficult for Apple to compete, but I don't know that it'a lost its technological edge. I'm confident that where Apple is today isn't where it will be tomorrow. They have products under development that will take advantage of the user interface in ways that probably aren't anticipated in the IBM world. They're willing to try a lot of things, and they're spending a lot of money in R&D.

Do you foresee that you'll be buying microcomputers other than the Mac?

You can never say never, but not based on what I know today. I don't think IBM'a PS/2 at this point is a cost-effective solution. Comparably speaking, in terms of the extra things you need to buy, and with the cost of OS/2 and Presentation Manager as software on top of the hardware, you're talking about a more costly solution. When you're talking about IBM Token-Ring as a network, Appletalk blows it away on price/performance.

What will it take for the Fortune 500 to fully embrace Apple and the Macintosh?

Apple has to be able to convince corporate America that they can service the customer better than IBM. Not as well, but better.

Apple is without a doubt fighting a mentality that'a out there. But I think that mentality is changing. The next two years is their window of opportunity, as products are being developed for the Presentation Manager.

What would you like to see Apple do next?

I'm always telling them, "Make it faster, with more capacity, and smaller."

SQL Performance for OLTP.

Tandem challenges anyone.

Zachmann

FROM PAGE 33

chief information officers, should ponder deeply Dylan's words in the context of modern information technology.

The mainframe and mini solutions that have best met the information systems needs of business for the past four decades are no longer adequate. Information systems professionals trying to maintain a posture of business as usual in the present technological and economic environment are doomed to failure.

A million 32-bit complex instructions per second on a mainframe computer today cost considerably more than $100,000. Microprocessor-based alternatives can deliver the same 32-bit complex instructions per second for as little as $1,000. The difference between the two is like the electrical charge that builds up in the anvil-shaped cumulonimbus cloud of a fast-moving cold front: It is poised to discharge dramatically upon the industry, with a lot of thunder and lightning.

Sure, big applications, big data bases, big transaction volumes and big computations are going to continue to require big computers. For the short term, big computers will continue to mean traditional mainframes and minis. They aren't going to disappear overnight.

However, lots of small and medium-size applications can already be run on microprocessor-based systems. Not just the increasingly powerful Intel 80386- and Motorola 68000-based personal computers, but a growing selection of network servers and multiple microprocessor-based systems, are starting to offer effective platforms even for quite large applications.

Microprocessor-based systems like Stratus's — sold by IBM as the System/88 — and Sequent's are already threatening mid-range minicomputer systems and are starting to move into mainframes' power ranges and territory. This is just the beginning.

Information systems professionals who are interested in a career that lasts through the 1990s can't afford to stick their heads in the sand and pretend that the mainframe and minicomputer world of the past will carry them successfully into the future. Dinosaur farming, to put it simply, is not the way to future success.

Rather, it will be through harnessing the incredibly less expensive capabilities of increasingly standardized microprocessor-based alternatives to traditional systems that the successful information systems careers of the 1990s will be built. It will not be those who master the details of the latest overpriced mainframe software who pull out ahead in the 1990s. Rather, it will be those who master the grammar and syntax of personal computers, local-area networks, server and client architectures, the C language, IBM's OS/2 and Unix.

Designing and building large-scale corporatewide information systems on inexpensive microprocessor-based platforms is the factor most critical to the success of information systems professionals in the 1990s. The future focus of my column here in the Microcomputing section of *Computerworld* will be on how we can do that. Take a few minutes to write to me in care of CW, if you would, and tell about what you'd like to see here. I'll do my best to respond.

Zachmann is vice-president of research at International Data Corp.

PRODUCTIVITY PLUS PERFORMANCE. NonStop SQL™ — the only SQL system that delivers OLTP performance. It's embedded right into the operating system. This is where the work is done, allowing the application to run at OLTP speed. You get a distributed RDBMS with the productivity, performance and data integrity that OLTP demands.

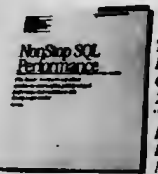
DATA INTEGRITY. DISTRIBUTED PROCESSING. MODULAR GROWTH. Users can read, write and update data anywhere in the Tandem network with full data protection. The database will always reflect the current state of business. You can grow the system to any size, in any increment. Yet to the user, the entire database will look like a local database.

OLTP fundamentals.

If you don't have them all, you don't have OLTP.

PRICE PERFORMANCE | NETWORKING | DISTRIBUTED DATA | LINEAR EXPANDABILITY | DATA INTEGRITY | SECURITY | FAULT TOLERANCE

NO ONE KNOWS OLTP LIKE US. Whenever there's a need for constantly current information, linear expandability and excellent price/performance, Tandem technology proves consistently superior. Compare us to any other OLTP system. You'll see why companies in every major industry choose Tandem. For more information, call 800-482-6336.



THE BENCHMARK. Call for this free, 20-page report, "NonStop SQL Performance." Eight 4-processor NonStop VLX™ systems process over 200 transactions per second with a response time of two seconds or less. The report sets a new standard for full benchmark disclosure.

TANDEM COMPUTERS
OLTP is On-Line Tandem Processing.

C425S

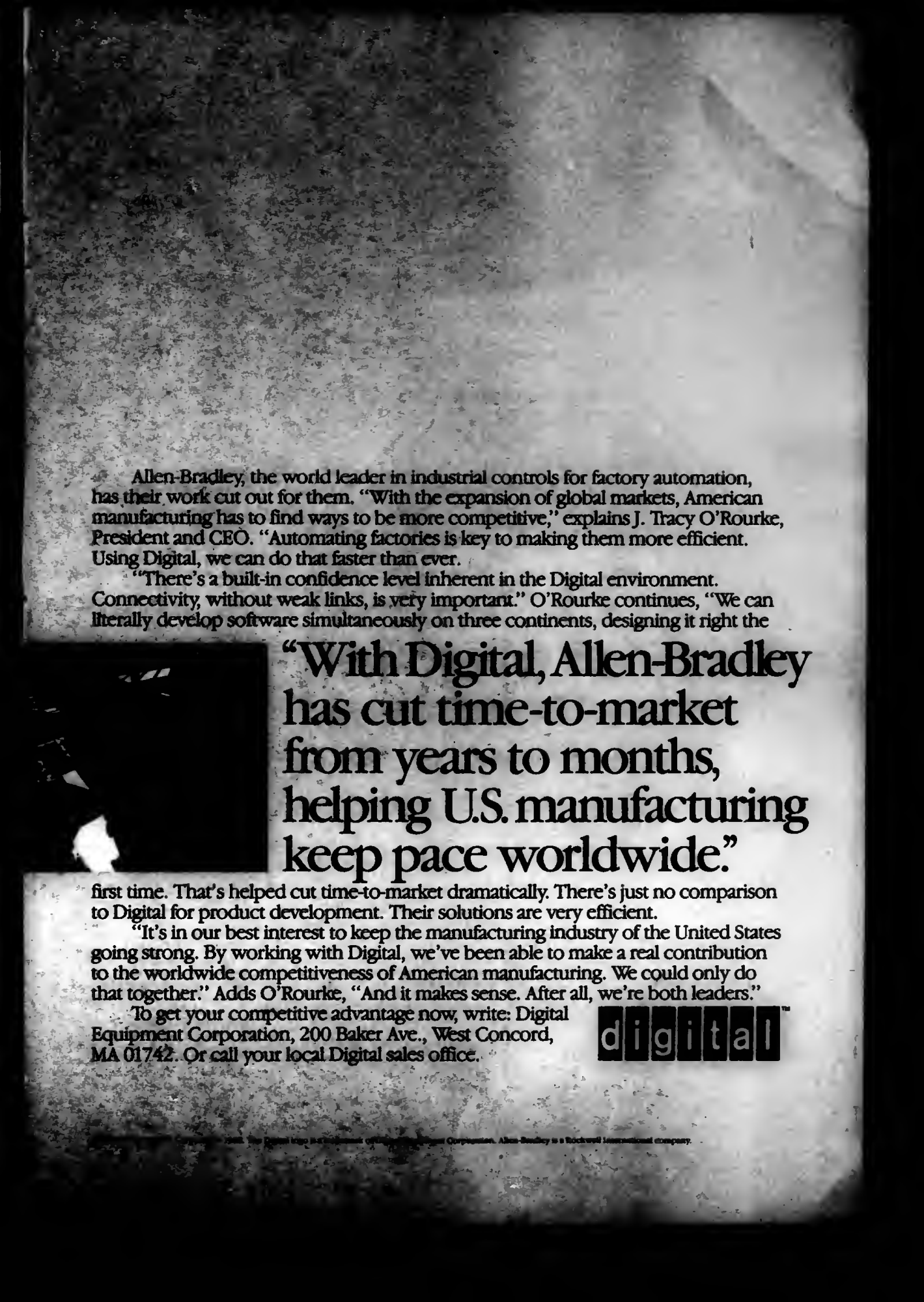
CMS/MVS Toolkit

The CMS/MVS Toolkit provides CMS users with a facility like TSO's SDSF.

ChicagoSoft

(312) 525-6400

Dig
no



Allen-Bradley, the world leader in industrial controls for factory automation, has their work cut out for them. "With the expansion of global markets, American manufacturing has to find ways to be more competitive," explains J. Tracy O'Rourke, President and CEO. "Automating factories is key to making them more efficient. Using Digital, we can do that faster than ever.

"There's a built-in confidence level inherent in the Digital environment. Connectivity, without weak links, is very important." O'Rourke continues, "We can literally develop software simultaneously on three continents, designing it right the

"With Digital, Allen-Bradley has cut time-to-market from years to months, helping U.S. manufacturing keep pace worldwide."

first time. That's helped cut time-to-market dramatically. There's just no comparison to Digital for product development. Their solutions are very efficient.

"It's in our best interest to keep the manufacturing industry of the United States going strong. By working with Digital, we've been able to make a real contribution to the worldwide competitiveness of American manufacturing. We could only do that together." Adds O'Rourke, "And it makes sense. After all, we're both leaders."

To get your competitive advantage now, write: Digital Equipment Corporation, 200 Baker Ave., West Concord, MA 01742. Or call your local Digital sales office.

digital™

Copyright © 1988 Digital Equipment Corporation. Allen-Bradley is a Rockwell International company.

Barney

CONTINUED FROM PAGE 31

derlying interface. IBM gained the right to add this mainframe graphics technology, called GDDM, in the name of improving Windows. So now, rather than a smooth port, it's major rewrite time for Windows developers.

The math is simple. Tack on a year or so to develop the Presentation Manager itself, add the years it takes to write robust applications, and you get an extra two- to four-year wait for Presentation Manager software. That is long enough for the typical machine, perhaps bought to run these phantom applications, to become fully depreciated and worn out.

The guru speaks SQL. Recently, we presented the views of Micro Data Base Systems (MDBS), a firm that is attempting to debunk the mythology of micro data base servers. MDBS, with its extended network architecture, was supposed to run circles around today's SQL products when it came to complex applications.

Ironically, later that same week, we received word from MDBS that the firm intends to support Ashton-Tate and Microsoft's SQL Server with its Knowledgeman, MDBS III and Guru data base software. SQL ain't so bad after all.

But is it still snake oil? For those interested in the SQL-vs.-the-world debate, calls ran two to one against SQL last week. Some believe SQL is snake oil and a memory hog designed by IBM to sell faster, and more expensive, systems. Others — particularly SQL vendors — maintain that SQL is God's gift to data base technology and well deserves its recent accolades.

One savvy SQL debunker is Jon Roland, chairman of Starwood Corp., a San Antonio-based software development and consulting firm. Roland believes he has given SQL a fair shot but claims it is too difficult for most humans and makes inefficient use of systems resources.

Another problem is that many are trying to use SQL as the foundation of complete development languages — a use for which it is ill-suited, Roland says. Nor does SQL permit single-record-at-a-time commands, a popular form of querying for many data base users.

Older, more established architectures are in many ways better, and new concepts may be on the way that could conceivably kick SQL's behind, Roland believes. He has much much more to say about SQL, including advice about alternatives, and we are trying to find the space for him to say it. So stay tuned.

Drop it now! One of the most alluring characteristics of Lotus's 1-2-3 Release 3 is not spreadsheet linking, or better graphics, or OS/2 compatibility. Instead, it is something that speaks to the very center of an MIS professional's being. That new element is simply the end of a nasty feature called copy protection.

Yet users expected Release 3 early this year, then expected it by mid-year, and now don't expect it till year's end. But Lotus doesn't have to rewrite 1-2-3 in C to end copy protection. They just have to remove it. So if you would like Lotus to stick to its original deadline, give 'em a call and ask them to dump it now. And tell them *Computerworld* sent you.

Is this the OS/2 blockbuster? Enyart Development Corp. may not be a household name, but the firm has laid claim to producing the first application written from the ground up to run under OS/2.

Although the product is called Tickler/2, it is not meant to entertain or torture your children or your spouse. Instead, it is designed to remind you to do things at particular times. Also, by using OS/2's multitasking sbility, Tickler can automatically cause the computer to execute a command, such as printing a file at the same time every week or sending the same electronic mail reminder, in background, without user intervention.

While Tickler/2 may not do for OS/2 what 1-2-3 did for DOS, it does show off some of the unique capabilities of the new operating system.

Barney is a *Computerworld* senior editor, microcomputing.

STOP IMSGENS

BMC SOFTWARE

In the U.S., 1-800-841-2031
In Canada, 1-800-231-2698
In Texas and Alaska
call collect, 713-240-8800

BMC Software, Inc. CW
P.O. Box 2002 • Sugar Land, TX 77487-2002

☐ I am interested in a 30-Day-Plus Free Trial of DELTA/IMS VIRTUAL TERMINAL

☐ Please contact me with more information on DELTA IMS VIRTUAL TERMINAL

Name _____
Title _____
Company _____
Address _____
City _____ State/Prov _____ Zip/PC _____
Telephone _____

Tired of frequent stops for IMSGENs? Install DELTA IMS VIRTUAL TERMINAL on your IMS/VS system and begin eliminating IMSGENs immediately.

IMS/VS requires a control block for every terminal in your network. Every time you add or delete a terminal, you must do an IMSGEN. You are faced with lengthy IMSGENs, or frequent IMSGENs, or delays in adding new users until the next scheduled IMSGEN.

With DELTA IMS VIRTUAL TERMINAL, you need only one control block defined in an IMSGEN for each *type* of terminal in your network.

- Terminal-related IMSGENs for 3270 and SLU2-type terminals are almost totally eliminated.
- New users can be added in minutes, on demand.
- Productivity for system programmers improves.

For more information on DELTA IMS VIRTUAL TERMINAL, or to begin a 30-Day-Plus Free Trial, clip and mail the coupon. Or call BMC Software.

Ampro tool

CONTINUED FROM PAGE 31

and vending machines.

Some users have used the board to build specialized portable computers, but Elliott Korenthal, Ampro's vice-president of sales, said the product was designed for small, low-power embedded systems rather than consumer-oriented laptops.

The concept is simple. Korenthal said his firm's Solid State Disk utilities allow users to run any standard Microsoft Corp. MS-DOS software without disk drives. The user needs only an Ampro Little Board/PC equipped with erasable programmable read-only memory, nonvolatile random-access memory or both.

Many of the burned-in applications will be custom written rather than off the shelf. "The customer will develop and debug his application program under DOS using a floppy- or hard-disk-based system," Korenthal explained. Next, the user can take the result of the development, run it through the utilities and then burn it onto the Little Board, he added.

The utilities software sells for $249, and a minimally configured board sells for $393.

"The Data General difference: individual attention."

Data General's working partnership is helping Maguire Insurance Group reach its goals.

Maguire Insurance Group is a premier provider of property and casualty insurance for the commercial automotive marketplace.

In such a dynamic industry, Maguire needs a computer system that supports their superior customer service, while giving them the flexibility to take advantage of market opportunities.

They turned to Data General in 1985 to replace outdated accounting and billing systems. By 1986 they were running a number of critical business applications, had brought 12 regional offices on-line, and had implemented CEO® office automation company-wide.

What resulted was a relationship that James Maguire, Chairman, says "does more than help us solve immediate problems; it has helped us improve our marketing and underwriting efforts, and become sophisticated managers."

And in 1987, when Maguire launched a new business venture, they again chose Data General.

They found that the Data General difference goes beyond the ability to cost-effectively provide tailor-made solutions, or to easily integrate all kinds of applications. Most importantly to Maguire, "It is the value which Data General places on our business. It's their individualized service and a willingness to understand and respond to our specific needs."

We've made the difference for many companies. Let us tell you how in the latest issue of PROFILES. Send in the coupon below, or call us at 1-800-DATAGEN. In Canada, call 416-823-7830.

Data General

3400 Computer Drive, Dept. ADV/MAG, Westboro, MA 01580
Please send me your current issue of PROFILES.

Name _____
Company _____ Phone _____
Address _____
City _____ State _____ Zip _____

CALL 1-800-DATAGEN

NEW PRODUCTS

Systems

A ruggedized 19-in. rack-mountable IBM Personal Computer AT-compatible system has been introduced by **Qualogy, Inc.**

The **QPC-7000** AT compatible uses a 12-slot passive backplane. It features an Intel Corp. 80286 microprocessor operating at 10 MHz, 1M byte of random-access memory, a socket for Intel's 80287 math coprocessor, a floppy-disk controller, a small computer systems interface Winchester controller, serial and parallel ports and a clock/calendar with battery backup.

Qualogy's QPC-7000

Also included is a disk carrier assembly capable of holding up to 3½-in.-tall drives, a drive-area cover door with a security lock, a system reset button and a 200-W power supply.

System prices start at $2,790.

Qualogy, 2241 Lundy Ave., San Jose, Calif. 95131. 408-434-5200.

Development tools

American Expertech, Inc. has announced **Release 2.0 of XI Plus**, its personal computer-based expert system shell.

Enhancements include forms and screen-capture facilities and knowledge base-controlled explanations.

Other enhanced facilities include the ability to change question, Help, why and report windows; the ability to control the examine conclusions menu; a C interface to large-memory models; file and library memory copy facilities; an options statement to extend the question definition; new reset command options; a knowledge base dictionary; printer control options; ease-of-use options; a virtual disk facility; an extended tutorial; and a range of supplied external programs.

XI Plus Release 2.0 costs $1,995.

American Expertech, Incline Village, Nev. 702-831-0136.

Software enhancements

An Apple Computer, Inc. Hypercard version of the task and time organizer **Executive Life** for the Apple Macintosh has been announced by **New West Software.**

Features of Executive Life include automatic posting calendars; contact demographics; a phone dialer with an automatic call log; up to 10 next-action items per contact; automatic notification of past-due action items; automatic to-do listings on variable time periods; a project manager; a categorized notes and numbers section; and unlocked code.

Executive Life costs $79.95.

New West Software, Suite B, 5462 Oceanus, Huntington Beach, Calif. 92649. 714-898-1039.

A version of **Quick Connect**, a multiuser operating environment for personal computers using the Intel Corp. 80386 processor chip, has been announced by **Virtual Systems, Inc.**

Quick Connect allows up to 12 active users or 32 casual users to simultaneously access spreadsheet, word processing and data base management programs, including Lotus Development Corp.'s 1-2-3, Wordperfect Corp.'s Wordperfect and Ashton-Tate Corp.'s Dbase III Plus. It also provides electronic mail and password security and supports modem communications.

The 386 version is compatible with existing versions for the IBM Personal Computer XT and PC AT. The product costs $595 for a seven-user system and $995 for a 32-user system.

Virtual Systems, Suite 406, 1500 Newell Ave., Walnut Creek, Calif. 94596. 415-935-4944.

An enhanced version of **Frontpage**, a desktop publishing program for IBM Personal Computers, has been announced by **Haba Computer Systems, Inc.**

The program uses an icon-oriented display and comes with a font library as well as some form and letter templates. Features include full hyphenation and justification, the ability to mix type styles and sizes and on-screen editing.

Frontpage accepts standard ASCII file formats as well as such graphics formats as Hewlett-Packard Co.'s HPGL.

Several add-on modules, such as a 20,000-word hyphenation dictionary, font packs and utilities for interfacing to typesetting equipment, are also available.

Frontpage costs $199.

Haba Computer Systems, Suite D, 16580 Harbor Blvd., Fountain Valley, Calif. 92708. 714-775-0695.

An enhanced version of the **Harvard Graphics** software program has been introduced by **Software Publishing Corp.**

Version 2.1 features a built-in spelling checker and approximately 300 symbols. Users can convert chart elements to symbols in order to edit each object in the graph independently.

Other capabilities include importing and exporting CGM metafiles to and from other graphics programs and exporting Adobe Systems, Inc. Postscript and Hewlett-Packard Co. HPGL files to desktop publishing programs.

The program supports the direct graphics interface standard and the vendor's Harvard Graphics LAN Pack, which provides multiuser access to Harvard Graphics 2.1

Harvard Graphics 2.1 costs $495. Current users can upgrade for $50. The LAN Pack program costs $1,795.

Software Publishing, P.O. Box 7210, 1901 Landings Drive, Mountain View, Calif. 94039. 415-962-8910.

An enhanced version of the **20/20** spreadsheet for multiuser computers has been announced by **Access Technology, Inc.**

20/20 Release 2 features a macro facility, a global rounding capability to control calculation precision, improved consolidation links and an iterative recalculation option to solve simultaneous equations and resolve circular references, the vendor said.

Other features include file password protection, graphics enhancements, improved report generation and additional financial, calendar, string and work sheet functions.

Worksheets that are developed under 20/20 Release 2 have the ability to run on all hardware platforms supported by 20/20, the vendor said.

Configured to run under Microsoft Corp.'s MS-DOS 2.0, 20/20 Release 2 costs $500.

Access Technology, 6 Pleasant St., Natick, Mass. 01760. 617-655-9191.

Ken Orr & Associates, Inc. has enhanced its **Brackets** computer-aided

Continued on page 52

DL/1 for the PC!

Excellent development or training environment
Advanced debug/trace facility
Support for BATCH and CICS
Support for EXEC DLI and CALL CBLTDLI
Identical to mainframe: download and run

Supports:
- MVS & DOS/VSE programs
- All database calls
- All command codes
- Secondary indexes
- Sparsing routines
- Boolean SSA's
- Relational SSA's

Interfaces for:
- Micro Focus COBOL
- Realia COBOL
- MBP COBOL
- Microsoft COBOL
- Digital Research PL/1

Per Copy Cost:
1 to 9 - US $450.00
10 to 24 - US $425.00
25 to 49 - US $400.00
50 to 99 - US $350.00

Utilities Included:
- Unload
- Reload
- Interactive query
- Real time tracing
- Mainframe PSB & DBD conversion to PC ACB
- ACB generation

Requirements:
- PC, XT, AT, PS/2 or compatible
- Monochrome or colour monitor
- 512K, product reserves 140K
- Hard disk drive

Interfaces with:
- Realia RealCICS
- Triangle Software CICS/pc

Softsphere Inc.
51 Harrison Ave.
Aurora, Ontario
CANADA L4G 1E2

Phone (416) 841-0734

Running out of time to shop for ...

- Used Equipment
- Software
- Rental & Leasing
- Supplies
- Financial/Business Services
- Hardware
- Communications Equipment
- Time & Services
- Bids & Proposals
- Training Services
- Real Estate

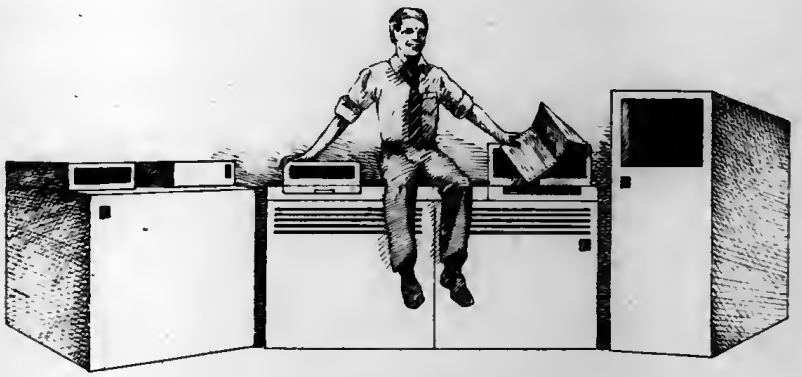
. . . Find what you're looking for in MARKETPLACE and save valuable time!

COMPUTERWORLD
MARKETPLACE

Shop for the products and services you need. Every week.

Coming to Chicago
May 10 and 11

There's No Better Way To Stay On Top Of Your Systems/3X



THE 1988 Systems 3X World EXPO.
If you're a S/3X user, you'll want to be there.

This is it. The one time this year when you'll find everything that's new for your IBM Systems 34/36/38 – all at one time, all in one place.

You'll see new products, meet new people, and attend product briefings and seminars on a range of current issues. You'll exchange information with other users, learn about new applications and reduce product-search time by months.

But most importantly, you'll discover ways to get the kind of performance your business demands from its Systems/3X.

Whether you're in management, operations or support, you'll find the Systems 3X World EXPO well worth your time. So why not check the schedule on the reverse side and start planning today to attend the EXPO nearest you.

After all, how else will you stay on top of your Systems/3X?

The 1988 Systems 3X World EXPO.
Your number one priority for a number of reasons.

1. It's geared to your needs. As a major national trade show designed expressly for Systems/3X users, the 1988 EXPO focuses directly on the problems, issues and news that concern you most. And you'll find information and discussion for all viewpoints, from senior-level management to MIS/DP/OA directors to programmers and operators.

2. It's got all the leading vendors. Meet with them directly, ask questions, see demonstrations, make comparisons -- you'll truly have access to the entire S/3X " universe."

3. It's got all kinds of products and services. Printers, storage media, communication hardware, security and maintenance -- they're all here and more. Plus there's software for every S/3X application, from financial and management to distribution to computer-assisted training.

4. It offers a wide range of timely seminars. Learn from the experts-- and get their help with your toughest questions--at over 15 seminars that cover topics ranging from mini/micro interfacing to what Silverlake will bring to the world of S/3X computing.

5. It's a chance to make new contacts. Systems 3X World EXPO is a chance to profit from the knowledge and experience of other S/3X users-- and it's a potential way to advance your career as well.

6. It's sponsored by SYSTEMS 3X WORLD magazine-- and it's free. *Systems 3X World*, the leading management-oriented magazine in the field, is the sponsor of this important trade show for S/3X users. Best of all, there are no fees: registration and all seminars are open to you free of charge.

Systems 3X World EXPO 1988 schedule:

February 2-3, 1988
Anaheim. CA
Disneyland Hotel

March 15-16, 1988
Philadelphia, PA
Sheraton Valley Forge

April 5-6, 1988
St. Louis, MO
Adam's Mark Hotel

May 10-11, 1988
Chicago, Il
Holiday Inn O'Hare

June 7- 8, 1988
Detroit, MI
Hyatt Regency Dearborn

September 7- 8, 1988
New York, NY
Sheraton Centre Hotel

September 29 -30, 1988
Toronto, Ont
Skyline Hotel

☐ Please send me detailed information on attending the 1988 Systems 3X World EXPO:

Location(s): _____

☐ I am interested in exhibiting at the following location(s):

_____

Name_____

Company_____ Title_____

Address_____

City_____ State_____ Zip_____

Please return coupon to National Productions, Inc., 27 Congress Street, Salem, MA 01970-9864. Or call us at (617) 745- 6010

CWCH

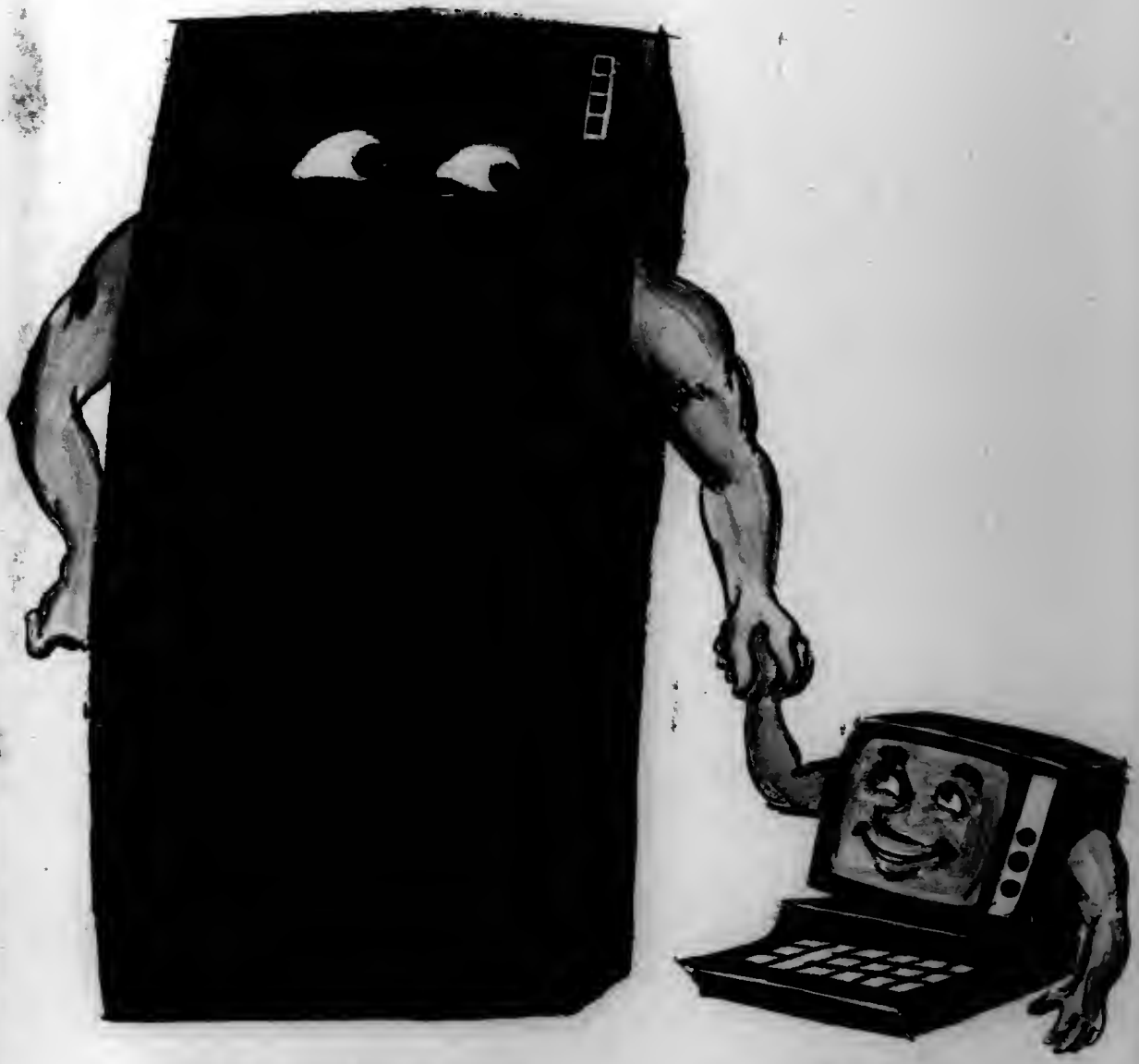
The 1988 Systems 3X World EXPO is managed by National Productions, Inc.

This show is not approved, sponsored by, or in any way connected with, the IBM Corporation. "IBM" is a trademark of IBM Corporation.

Systems 3X World EXPO

National Productions, Inc.,
27 Congress Street, Salem, MA 01970-9864.
(617) 745- 6010

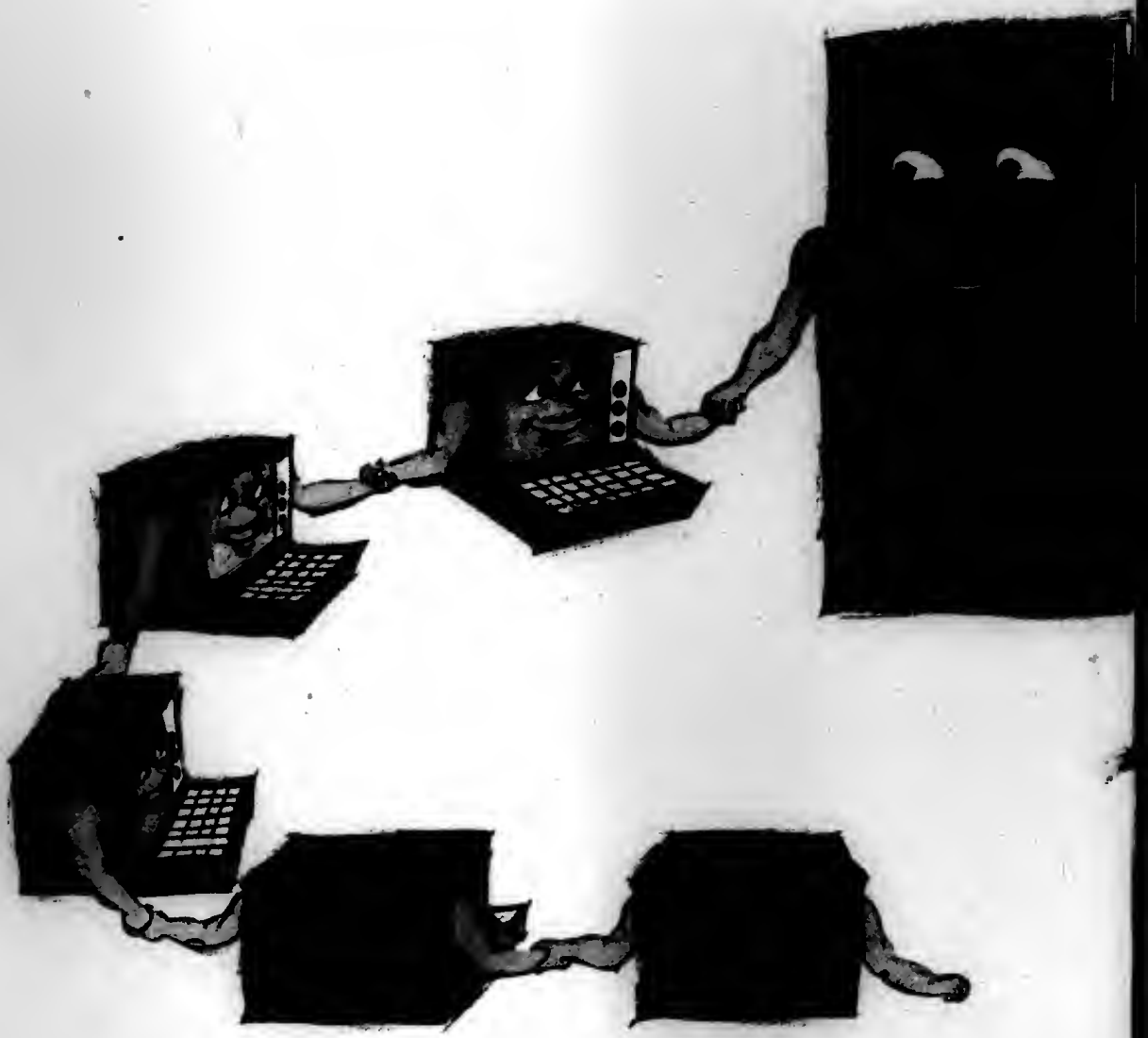
The PC war is over.



The mainframe.

The PC.

PC Integration: the world of



Hottest topic in computers.

The PC war is over, and the computer professionals have won.

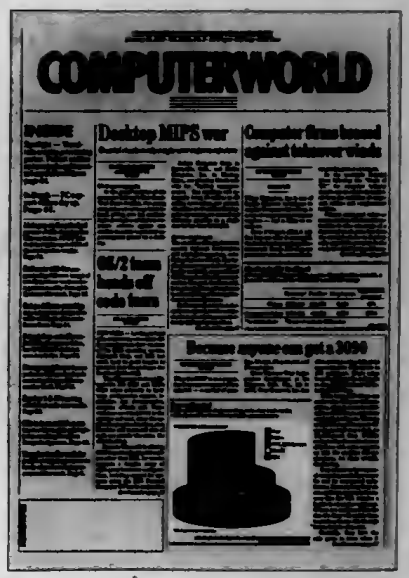
Almost overnight, the market for personal computers has changed. The individual user no longer runs out and buys whatever strikes his or her fancy.

PC's have grown up, and MIS has taken over responsibility for their role in the corporate information system. "During the past three years, everything has become integration," says Leon Jackson, senior research analyst at Arthur D. Little. "The only computer force that can provide integration is MIS."

The standalone personal computer has become part of a network. And MIS departments are working to set PC standards so that their organizations can benefit from sharing of information, including databases and software.

The stakes are huge. This year, companies will spend more dollars buying PC's than they will spend on mainframes.

And who will control this spending? The readers of Computerworld, of course. It's the newspaper of record for information systems management. Put your money where your market is. In Computerworld.



Computerworld: The newspaper of record.

An IDG Communications Publication

375 Cochituate Road, Box 9171, Framingham, MA 01701-9171 (617) 879-0700

Continued from page 48

software engineering tool to include the automatic generation of Cobol code from Warnier-Orr diagrams.

Brackets is an interactive diagraming system for IBM Personal Computer-compatible workstations. Version 2.0 provides a menu-driven DOS shell utility; unlimited Warnier-Orr diagram sizes; a search-and-replace function within diagrams and code; context-sensitive Help; user control of print format and pagination; and full-screen text processing.

Two forms of Brackets are available: Brackets Plus, priced at $475, includes a Cobol code generator; Brackets Basic, $275, provides thought organiser capabilities.

Ken Orr & Associates, Suite 301, 955 American Lane, Schaumburg, Ill. 60173. 312-843-7020.

Computer Associates International, Inc. has announced an enhanced version of its Superproject Plus resource and project management software package.

Version 3.0 features a Lotus Development Corp. 1-2-3-style interface; a choice of experience level; context-sensitive graphic Help screens; outline and worksheet breakdown, integrated with Pert and Gantt structures; top-down planning with outline spreadsheet; custom multiple resource calendars and graphic histograms; report generation; and a link to mainframe systems.

Superproject Plus 3.0 costs $395.

The company also announced **Compress**, a spreadsheet file compression program for use with Lotus's 1-2-3 and with Computer Associates' Supercalc4. It costs $79.

Computer Associates, 1240 McKay Drive, San Jose, Calif. 95131. 408-432-1727.

A version of **Cadkey**, a two- and and three-dimensional mechanical engineering system for personal computers that uses memory above DOS's 640K-byte barrier, has been announced by the Cadkey division of **Micro Control Systems, Inc.**

Cadkey 3 Plus incorporates A.I. Architect, Inc.'s OS/286 and OS/386 software to reportedly migrate as much as 4G bytes of memory above the conventional 640K-byte addressable memory limit.

By breaking the 640K-byte barrier, the product moves into protected mode and leaves at least 350K bytes available for other applications, according to the vendor.

Cadkey 3 Plus is priced at $3,690.

It is available as an upgrade to Cadkey 3 for $495.

Cadkey, 27 Hartford Tnpk., Vernon, Conn. 06066. 203-647-0220.

A local-area network version of **CATS**, an IBM Personal Computer-based computer asset tracking system, has been introduced by **Bendata Management Systems, Inc.**

CATS was designed for controlling and managing PC and mainframe hardware, software and data lines through on-order management, inventory management, problem management and change management.

The LAN version allows an unlimited number of simultaneous users, the vendor said. Also, entire records may be added or edited without locking other users out of available functions.

Other features include the use of temporary report index files, the use of common source code for both the LAN and single-user versions and an IBM Nethios-compatible set of commands, the vendor said.

The LAN version of CATS costs $3,250.

Bendata, Suite 530, 4144 N. Central Expwy., Dallas, Texas 75204. 214-823-2784.

An enhanced version of the **Media Master** disk-to-disk format conversion utility for IBM Personal Computers and Personal System/2s has been announced by **Intersecting Concepts, Inc.**

According to the vendor, the utility permits an IBM PC to read, write and format more than 200 CP/M and Microsoft Corp. MS-DOS disks.

Features of Version 5.0 include support for the PS/2 computers using 1.44M- and 720K-

We're Making It Easy For

AST Premium Connectivity™ Products. The names on these mailboxes are some of the most important families in American business. The computer families that companies trust to process, store and exchange vital data.

Now, AST is making it easy for these families to live together. That's because our own family of Premium Connectivity products is designed with advanced features and top-of-the-industry speed and performance. Plus, compatibility with existing and emerging industry standards.

Local Area Networking. AST offers a wide selection of networking products, including AST-Ethernet,™ the fastest Ethernet adapter in the industry. It offers flexibility, compatibility and unprecedented throughput for I/O intensive applications.

Besides AST-Ethernet, we offer the AST-StarSystem™ and the AST-Resource Sharing Network™ And if you've already installed a LAN, and want to expand, AST-Advanced Netware™ can bridge old networks to new ones.

PC-to-Mainframe Connectivity. We put an end to the issue of standards. If you're tired of figuring out the advantages of IRMA® over IBM, or IBM over IRMA — forget it. AST-3270/CoaxII™ offers hardware, API and keyboard compatibility with both standards.

And if you're looking for speed, versatility and key features in DFT and APA graphics, check out the software options for AST-3270/CoaxII.

When you're ready to make remote 3270 SNA/SDLC connections from your PC or PS/2, try AST 3270/SNA II™ It offers: multiple sessions, 3287 printer support, keyboard macro facilities and much more.

The AST PC-to-Mainframe family also includes 3770, 3780, BSC and SNA Gateway products.

PC-to-3X Mini Connectivity. Our 5250 emulation products have been built around careful family planning. Our System/3X connectivity solutions include: Local, Remote, Gateways, Clusters and Async Dialup. And, they all work with the new PS/2s, as well as the AT/PC architecture.

Enhanced AST-5251/11 Plus™ has captured the attention of the industry with its emphasis on features. Features like: seven concurrent display/printer sessions,

byte floppy disk drives, the ability to customise the program through set-up files, full color support, on-line context-sensitive Help, first-letter menu selection and a simplified installation procedure.

Media Master 5.0 costs $49.95.

Intersecting Concepts, Suite 1A, 80 Long Court, Thousand Oaks, Calif. 805-373-3900.

Nostradamus, Inc. has announced Version 5.0 of its **Turbo Plus.**

Turbo Plus has been upgraded to support Version 4.0 of Turbo Pascal. It does not support the earlier versions of Turbo Pascal.

Other new features include a screen painter, an I/O source code generator, a support library with display mapping, screen genie support, color mapping, a color map generator, sound, dynamic menus, universal menus, screen support, special effects, a keyboard, a cursor, diagnostics, file handling, system resources, critical error handling and sample programs.

Also included is customizable pop-up Help.

Turbo Plus 5.0 costs $99.95

Nostradamus, 3191 S. Valley St., Salt Lake City, Utah 84109. 801-487-9662.

Concentric Data Systems, Inc. has announced **Version 3** of its **R&R Relational Report Writer** for use with Ashton-Tate Corp.'s Dbase III and Dbase III Plus on IBM Personal Computers.

R&R allows users to create reports without programming. Enhancements to Version 3 include support for simultaneous users on networks, reduced memory requirements for R&R runtime and user-defined functions.

R&R can relate and report from up to 10 files at once using Lotus Development Corp. 1-2-3-like menus.

Free-form text and fields can be printed in any layout. New fields can be calculated using more than 75 predefined functions plus any number of user-defined functions.

R&R carries a price of $149.

Concentric Data Systems, 18 Lyman St., Westboro, Mass. 01581. 617-366-1122.

Data storage

An optical disk-based storage and retrieval system that attaches to an IBM mainframe channel through a channel adapter has been announced by **Aquidneck Systems International, Inc.**

According to the vendor, **Optical Archiving Systems 3420** provides access to more than 10G bytes of on-line data. It reportedly allows attachment of a standard nine-track 1,600/6.3G bit/in. magnetic tape drive unit.

Data may be transferred to tape in pass-through mode or transferred to optical disk in on-line mode, according to the vendor.

Other devices attached to the channel adapter can access the data on the optical disk directly.

The unit emulates the IBM 3803 Model 2 control unit and 3420 tape drive at any subset of the 256 host subchannel addresses.

Optical Archiving Systems 3420 is priced from $35,000 to $56,000.

Aquidneck, 650 Ten Rod Road, North Kingston, R.I. 02852. 401-295-2691.

Printers/Plotters/Peripherals

An IBM Video Graphics Array **controller card** for the IBM Personal System/2 has been announced by **Moniterm Corp.**

Designed to interface Moniterm's 19-in. Viking 1 monitor with IBM PS/2 Models 50, 60 and 80, the controller supports a resolution of 1,280 by 960 pixels at 66Hz.

According to the vendor, the product is compatible with such operating environments as Microsoft Corp.'s Windows, Digital Research, Inc.'s GEM, Media Cybernetics' Dr. Halo and Lotus Development Corp.'s 1-2-3 as well as Autodesk, Inc.'s Autocad.

The Viking 1 for the IBM PS/2 costs $2,395.

Moniterm, 5740 Green Circle Drive, Minnetonka, Minn. 55343. 612-935-4151.

Families To Live Together.

advanced file transfers, a new cable connection that uses inexpensive telephone wire (RJ11) and an on-board 80186 CPU for maximum performance. All of this for the PC and the PS/2, too.

Connectivity Stations. Looking for a great PC that's already configured for connectivity? AST offers the AST Premium LAN Station,™ the AST Premium 5250 Station™ and the AST Premium 3270 Station.™

Based on a revolutionary, small-footprint 286 personal computer, these Premium Connectivity Stations are powerhouses of desktop computing and terminal emulation.

We're Really A Family Business. When it comes to getting families to work together, AST has it all. And in an age when standards seem to exist only to be broken, AST stands committed to providing the very best connectivity products for your needs, for today and tomorrow.

If you're interested in finding out more about AST Data Connectivity products, call AST at: (714) 863-9991, operator AC2 or send in the coupon.

☐Yes, send me an AST product catalog.
☐Yes, have an AST respresentative call me.

Name _____
Title _____
Company _____
Address _____
City _____ State _____ Zip _____

Send to: AST Research, Inc. 2121 Alton Avenue Irvine, California 92714-4992, Attn: M.C. CW 4/25/88

AST® RESEARCH INC.

Times Have Changed.

AST markets products worldwide—in Europe and the Middle East call 44 1 [illegible]; in the Far East call [illegible]; in Canada call 416 [illegible]. AST and AST logo registered and AST-Ethernet, AST-StarSystem, AST-Resource Sharing Network, AST-3270/Coaxil, AST-3270/SNA II, Enhanced AST-5251/11 Plus, AST Premium LAN Station, AST Premium 5250 Station and AST 3270 Station trademarks AST Research, Inc. IBM registered and PS/2 trademark International Business Machines, Corp. IRMA registered trademark Digital Communications Associates, Inc. Copyright © 1988 AST Research, Inc. All rights reserved.

DATA STREAM

Mitch Betts

FCC chair on wobbly legs

One of the rules of Washington politics is that each politician has a certain amount of political capital — assets measured in power, public support and goodwill. Every time a politician asks for someone's support for a controversial idea, he spends some of that capital.

Well, Dennis Patrick, the chairman of the Federal Communications Commission for the past 12 months, has managed to use up more political capital than he ever had to begin with. He's in the hole, having squandered his chips on three dead-end projects:

- A proposal to raise the access charges on enhanced-service providers such as Telenet, Tymnet and Compuserve by roughly $4.50 per hour. This notion drew thousands of letters of protest from users of value-added networks and has since been quietly withdrawn.
- A proposal to raise access charges for private corporate networks that leak traffic to the public-switched network. Amazingly, the FCC launched into this proceeding without any assurance that the local telephone company could even measure this leaked traffic, which is likely to peter out in the next few years anyway.
- A vague proposal to dramatically reform the way that AT&T's common carrier ser-

Continued on page 62

Chase automates telex intake

AI system routes messages to departments, eliminating grunt work

BY ELISABETH HORWITT
CW STAFF

NEW YORK — The Chase Manhattan Bank NA has developed a natural language system that could eliminate a lot of the grunt work involved in processing incoming telex messages, according to Richard Pandullo, division executive at Chase's Telegraphic Services Division.

Pandullo oversees Chase's message network, which processes approximately 3,500 telex messages daily, 24 hours a day. Operators view each message on-screen to determine whether the subject is administrative or financial, which department it should go to and whether it is a sensitive document, such as a request to transfer $100 million to another account.

The fact that most telexes are free-form documents — they lack a standardized format for presenting and laying out key data — makes the scanning process labor-intensive and costly, Pandullo said. "And, if you don't do it right, it causes the bank a lot of embarrassment."

Two years ago, Pandullo concluded that he could boost the quality, speed, efficiency and productivity of the telex intake process by implementing natural language processing — software using artificial intelligence that would abstract and interpret key information from telex documents. At the time, "AI didn't seem mature enough" to begin the design process, Pandullo said. A little more than a year ago, however, he proposed and received approval for his project.

Task force

The six-month development effort involved three seasoned programmers, a systems officer and a line manager. "We needed to incorporate the money-transfer and telex-processing expertise from both the systems and telegraphics staff," Pandullo explained. A 10-person task force made up of auditors and systems and operations people reviewed the project's progress every two weeks.

The initial system, named Autoscreen, was written in Pascal and runs on a Digital Equipment Corp. VAX-11/780. It automatically extracts test keys — code words that are used to validate the type of message — and identifies whether the message is a letter of credit, a funds transfer request or some other type of business document. "The system determines that yes, this came from the Bank of Tokyo, it is valid, and it goes to the letter-of-credit department for processing," Pandullo said.

In its next phase of development, Autoscreen will be able to route documents automatically

Continued on page 60

Users want something that works

BY PATRICIA KEEFE
CW STAFF

ANALYSIS

It's always jumping out here on the LAN-scape. If it's not the rumbling of mergers, it's the grumbling and ranting associated with de facto standards wars. And God knows we've got more communications-related standards than the average local-area network manager can shake a cable at, with no end in site.

On-site it's a different matter. Users don't really care much about cutting-edge technology. They're too afraid of slitting their own throats.

Nope, their desires are simple. They just want something that works, something that's

Continued on page 60

Data View

T1 sales growth, 1986 to 1989

Networking T1 multiplexer sales pace projected to moderate; point-to-point multiplexer sales to pick up next year

INFORMATION PROVIDED BY VERTICAL SYSTEMS GROUP AND SALOMON BROTHERS, INC.
CW CHART

IBM to push EDI hard

Firm links user hosts to value-added net

BY PATRICIA KEEFE
CW STAFF

TAMPA, Fla. — IBM has big plans for Information Network, its entry in the value-added network sweepstakes. Serving as a lightning rod for all those value-added services is electronic data interchange (EDI), an electronic method of billing and payment between trading partners.

"In the last 18 months, we've made big strides in this area. It [EDI] is the big new area of growth," said Jim Pickerill, IBM's director of marketing and support under Inter-Organizational Systems (IOS). "We aim to be a major player."

IBM's game plan is pretty straightforward: Attach IBM host accounts to the Systems Network Architecture (SNA)-based Information Network and

Continued on page 62

Inside

- Fujitsu, Pepperidge Farms team up to deliver remote networking services. Page 58.
- Azure releases data scope to support IBM SNA networks. Page 66.

Superior IBM - DEC Connectivity

The Forest Network Processor is the superior multivendor connectivity solution for organizations with IBM and DEC networks.

Superior Features

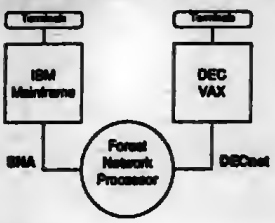
The Forest Network Processor's network services include bi-directional virtual terminal emulation, file transfer, network statistics, and diagnostics.

Superior Compatibility

The Forest Network Processor does not introduce a new protocol into your network, nor does it require emulating a foreign protocol on your mainframe or mini. IBM mainframes are connected to the network processor using SNA protocols and DEC VAXs are connected using DECnet protocols.

Superior Performance

The performance of your mainframes and minis is improved by offloading datacomm overhead onto the network processor. Each processor is powerful enough to support up to 500 virtual terminal sessions. For high speed data transmission, the network processor supports IEEE 802.3 and Ethernet LANs as well as multiple serial datacomm lines with transmission speeds up to 56K bps per line.



For a Forest Network Processor product information kit, please call (517) 349-4700.

forest computer

1740 Hamilton Road
P.O. Box 999
Okemos, Michigan 48864
(517) 349-4700
Telex 650887088

Introduc The NC
When No Ro

R System 10000.
om For Compromise.

INTEGRAT[illegible]

Advanced develo[illegible] language incorpo[illegible] relational database [illegible] 10000 to help reduce applica[illegible]

End user needs can be tra[illegible] applications through picture program[illegible] advantage of telling the System 10000 w[illegible] without having to tell it how to do it.

BROAD PERFORMANCE RANGE

The System 10000 combines open systems architecture with the enhanced performance of NCR's 32-bit processor technology and ITX operating system. Four models provide the flexibility to meet your requirements—from a basic system to a clustered configuration with connectivity for up to 4,000 workstations.

[illegible]MPROMISED SERVICE AND SUPPORT

To provide maximum system availability, NCR's System 10000 is available with our Expert System for Preventive maintenance (ESPm)...including artificial intelligence, remote maintenance and unattended analysis. Plus, NCR's service and support teams are available for over-the-phone diagnosis or an on-site call.

The NCR System 10000. Created to increase productivity for data processing and business professionals. For more information, dial 1-800-CALL NCR.

NCR

creating value

CORVISION™ IS A TRADEMARK OF THE CORTEX CORPORATION. ORACLE® IS A REGISTERED TRADEMARK OF THE ORACLE CORPORATION. NCR IS THE NAME AND MARK OF NCR CORPORATION.
© 1988, NCR CORPORATION

Fujitsu delivers hit recipe for mobile link

BY KATHY CHIN LEONG
CW STAFF

NORWALK, Conn. — Pepperidge Farms, Inc., a nationwide purveyor of baked goods, has risen to the challenge of delivering remote networking services to its 2,400 independent distributors to help accelerate the ordering process.

A subsidiary of Campbell Soup Co., Pepperidge Farms has penned a multimillion dollar pact with Fujitsu America, Inc. for handheld computers, printers and communications interface units that will be installed in the company's delivery trucks.

The bakery unit has recently finished a trial of the system in the greater Boston area, where it tested the mobile computers for reliability and durability.

MIS leads the way

According to Douglas Parrish, vice-president of MIS at Pepperidge Farms, "Our company recognized the need to push information strategies out into the forefront of the company to help us to do a better job. For months, we tested products from several manufacturers to make sure their units could endure climate ranges — from the humidity of Florida to the subfreezing temperatures of Chicago."

Even though the Sales Trans Action Routing System (STARS) will not finish its rollout to all distributors until the end of 1989, according to Parrish, those that have been delivered have already had an impact.

Until now, the existing ordering system has been purely manual. Each independent distributor mails his orders and invoices to the company, and the data is then keyed into a terminal attached to a mainframe.

"Let's say a distributor is ordering something for next week," Parrish said. "By the time we get the order sent here, several days have elapsed. What we mainly want to do with STARS is accelerate the information flow."

The handheld computer developed by Fujitsu contains 296K bytes of memory and is powered by Nicad batteries when placed in the communications interface unit cradle mounted in the truck.

The unit reportedly can upload sales and settlement information to the mainframe by way of a modem at speeds of up to 9.6K bit/sec.

Orders updated on-board

Drivers can enter orders, create invoices and obtain hard copy from an on-board 80-col. printer.

They can also get a purchasing history on each customer and keep track of when the last delivery was made.

At the end of the day, the data is routed through a public packet-switched network and uploaded into Pepperidge Farms' mainframes.

Although the system is not an interactive on-line network, according to Parrish, the application is suitable for what the drivers need to accomplish — to make the correct deliveries on time. "In our business, we are dealing with perishable items," he explained. "By ordering early, we will be able to deliver faster and more accurately."

Sales information can also be transferred to the company's marketing department for future forecasting.

"We were doing that before [manually], but now everything is done much faster," Parrish said.

Fujitsu may have supplied the hardware, but the MIS department at Pepperidge Farms insisted on developing its own software for the network.

'A shared investment'

Pepperidge Farms is in a unique business position because of the fact that its distributors are independent businessmen and not employees.

"There are a lot of features we put in our software that are tailored to the distributors," Parrish stressed. "We consider this a shared investment, and they will also help pay for the system."

Parrish said the system is relatively easy to learn, and the company is sending out employees to install STARS and train the drivers through the use of manuals and videocassette tapes.

STARS is only the beginning of what promises to be several more applications that will be created for the drivers, according to Parrish.

This application falls under the umbrella of bakery-route accounting, a relatively new application in the foods industry. The Pepperidge Farms pilot follows a similar rollout by Frito-Lay, Inc. which involved 10,000 handheld units.

Fujitsu's Gary Chapman, vice-president of handheld systems, said the snack delivery business has utilised automated delivery systems since the late 1970s.

"It hasn't been until the last three years that the technology has come down to make this more economic [for users]," he said. "Battery life is longer, and there is more memory in the system than ever before."

U.S. West adds net tools

Answers user call for open systems development

BY KATHY CHIN LEONG
CW STAFF

BELLEVUE, Wash. — U.S. West Network Systems, Inc. has added a second key component to its line of network management tools that is said to juggle products from multiple vendors.

The announcement is a response to user pressure for network management suppliers to develop open system support.

A wholly owned subsidiary of U.S. West, Inc., the firm is one of a few independent specialists in the increasingly complex field of multivendor network management.

The recently introduced Netcenter Inventory Information Management (IIM) uses a data base to monitor IBM Systems Network Architecture (SNA) and non-SNA devices.

Cincom Systems, Inc. in Cincinnati, with its popular Netmaster host-based SNA network management software, is a well-known competitor of U.S. West.

Netcenter IIM, which is slated to ship in the third quarter, must be used in conjunction with Netcenter Graphic Network Monitor (GNM), Network Systems' first product and the foundation of a full complement of management tools.

The Netcenter family features a graphical personal computer interface that can be customized to display a network configuration on a map, the vendor said.

Simpler is better

"Network management has to get simpler as it gets pushed farther away from the data center. These tools have to be made so that less technical users will be able to manage networks," said Clare Fleig, an analyst at International Technology Group in Los Altos, Calif.

GNM gives users the ability to view the current status of their SNA networks, but it does not deliver any detailed information about the components or give users the ability to monitor non-SNA gear.

Netcenter IIM reportedly works with IBM's Netview and runs on IBM mainframes running MVS/XA and VTAM as well as on IBM Personal System/2s supporting Microsoft Corp.'s MS-DOS.

Priced from $15,000, the software keeps inventory records of components, displays who to call when a node is down and gives a detailed description of individual network parts.

U.S. West Network Systems said it will seek development partnerships that will allow Netcenter to interface to other vendors' products and network management tools.

Interlink extended gateway supports TCP/IP and Decnet concurrently

BY PATRICIA KEEFE
CW STAFF

FREMONT, Calif. — Interlink Computer Sciences, Inc. recently announced what it called a major extension of its 3732 Gateway technology by offering multichannel and concurrent support of Transmission Control Protocol/Internet Protocol and Digital Equipment Corp.'s Decnet.

Interlink said its long-term goal is to provide a multivendor gateway.

Additional features of Interlink's 3732 Model 450 Network Controller include data transfer rates in excess of 1M bit/sec.; 256 simultaneous session, or logical link, support; and channel interface technology said to provide optimum throughput capabilities and the ability to expand the functionality of the high end of Interlink's Gateway family.

The channel interface is a replacement of older technology and supports multiple network protocols simultaneously on a single channel, the vendor said.

The Model 450, when combined with other Interlink software, provides bidirectional file transfer and terminal emulation, program-to-program communications, distributed data base access and electronic mail exchange.

The multiple channel attachment feature gives users a choice between attaching a single Interlink network controller to several IBM mainframes running IBM's VM or MVS or attaching to several channels on one mainframe. Data may then transfer between the mainframes directly without accessing the network, Interlink said.

The basic 3732 Model 450 Network Controller costs $82,950 and is expected to be available in this quarter. Upgrades are available for customers using the older Model 400.

Enhanced OA system unites DOS, OS/2 users

BY JAMES DALY
CW STAFF

SAN LEANDRO, Calif. — Conetic Systems, Inc. has released an enhanced version of its Higgins office automation software, which is said to join Microsoft Corp. MS-DOS and IBM OS/2 users on a single network.

Version 2.25 runs in the protected mode of OS/2 and provides a single user interface to networks with both MS-DOS- and OS/2-based personal computers.

The upgrade is available immediately and is the first in a product suite based on OS/2, according to Howard Case, vice-president of marketing at Conetic Systems.

E-mail coming

The company also plans to deliver an OS/2 version of Higgins Mail, the firm's stand-alone electronic mail package, within 30 days.

Although Case added that Conetic Systems is planning a new set of Higgins products based on OS/2, Microsoft's OS/2 LAN Manager and IBM's Presentation Manager, he assured current MS-DOS users that the company will not abandon them.

"DOS will continue to play an important role in corporate computing for a long time yet, and we will support DOS users as well as users with a mixture of systems," Case noted.

The full spectrum

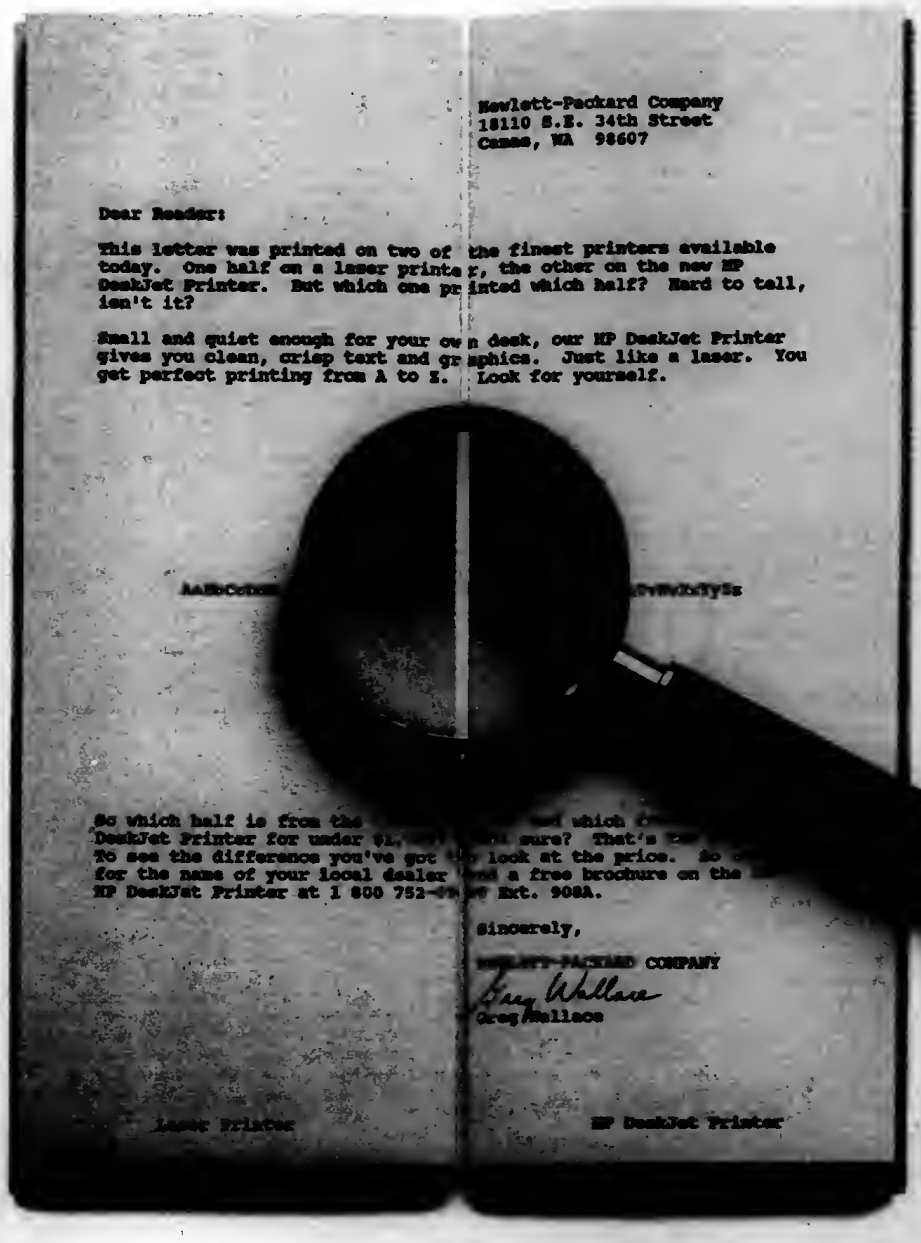
Aimed at work groups, Higgins software is a broad-spectrum office system of E-mail, scheduling and project-tracking functions designed for local-area networks.

A battery of users can tap into a relational data base that gives access to group calendars, shared project information and a personal filing system, according to Conetic Systems.

Version 2.25 is priced at $995. However, users of the current release who wish to acquire OS/2 support may upgrade for $25.

If you can see the difference, you must be looking at the price.

we never stop asking "What if..."



The New HP DeskJet Printer. Laser-Quality Output for Under $1000.

HEWLETT PACKARD

©Hewlett-Packard Co 1987

'EDI Yellow Pages' goes to press

Users looking for trading partners or suppliers of electronic data interchange products and services now can consult the "EDI Yellow Pages," published by EDI, Spread the Word. The publisher estimated that 97 of the Fortune 100 companies use electronic data interchange. The directory is free to qualified purchasing and traffic managers and listed companies. It costs $19.95 for others and for multiple copies.

Tandem Computers, Inc. has successfully concluded its tender offer for Ungermann-Bass, Inc. A preliminary count shows more than 95% of the outstanding shares of common stock were tendered. The merger is expected to be completed by June 30.

Altos Computer Systems recently signed a $13 million agreement with CLSI, Inc. to market the Altos 386 Series 2000 computer, a Unix-based multiuser system. CLSI, a supplier of library automation systems, will market the Series 2000 as a hardware platform for its Unix-based software for small and medium-size libraries.

US Robotics, Inc. announced that it is now offering Hillgroeve, Inc.'s Hyperaccess data communications software as an option to users of the modem maker's new Courier 2400/PS internal modems for IBM Personal System/2s. Tests by both companies of the modem/software combination reportedly documented data transmission rates in excess of 10,000 bit/sec. for ASCII and binary file transfer.

Digital Equipment Corp. and Micotel Ltd. have announced an agreement to jointly develop an integrated public network management system called Networks. It is targeted at network operations managers of North American public exchange carriers, such as the former Bell operating companies, large independent phone companies, interexchange carriers and Canada-based telephone companies.

Networks will be designed to provide network management capabilities for telecommunications equipment in multivendor environments. It reportedly will integrate any number of standalone operating support systems and encompasses both digital and analog systems. High-level interfaces to Networks will be published, the vendors said.

Omnitel, Inc. and Spectrum Cellular Corp. are jointly developing an error-checking protocol they claim will double modem speed for cellular laptop modems by adding data compression and synchronous capabilities. Normal land-line modems and error correcting protocols are not effective in cellular environments, Omnitel said.

The Enhanced Cellular Error-Correcting Protocol is slated to be available in the fall, with pricing in the $700 to $800 range. The data compression reportedly will allow users to increase throughput from 2,400 to 4.8K bit/sec. It will also avoid environmental-related signal losses or distortions. The enhancements will be provided through a daughter card that plugs into the motherboard.

Stanford University has chosen Develcon, Inc.'s TCP-PAD gateway to link the school's Ethernet network to CCITT X.25 environments. The gateway, which is currenlty installed and operating, provides one Transmission Control Protocol/Internet Protocol and three X.25 interfaces. The TCP-PAD allows remote users worldwide to access host computers located on the Ethernet local-area network via the Telenet public data network.

Gandalf true to IBM

WHEELING, Ill. — Gandalf Data, Inc. recently unveiled Starpatrol, an integrated operational control system said to show the company's commitment to supporting IBM's Netview network management concept.

Targeted at users of hybrid networks, Starpatrol initially will operate as a service point to provide administration and management for non-IBM Systems Network Architecture and other non-IBM devices and systems.

It reportedly will be expanded to full focal point control, which will provide centralized control and deliver network management services to all attached components within the monitored environment via a series of enhancements scheduled for later release.

To ensure upward migration with IBM's Netview/PC, Starpatrol is based on IBM's Personal System/2 family. It attaches to networks operating with Gandalf's Starmaster virtual channel connectivity system or Pacx 2000 data private branch exchange family.

Starpatrol provides for real-time data capture, storage and display capability for centralized network administration and maintenance of data communications devices on the network, according to the vendor.

By providing a single collection point platform that enables the console facility to be operated from anywhere in the network, Starpatrol reportedly minimizes the need for duplicate site-oriented subsystem and technical staffing resources.

Release of the product and price information is slated for May.

Users

FROM PAGE 55

easy to use and something that will leave them with change in their pockets.

Whatever they buy has got to work, because they don't have the time, energy or job security required to cope with a lemon. It's got to be easy to use, because chances are there will be problems, and getting help after the sale can prove trickier than isolating the problem in the first place.

Gee. No: N-E-T

Which bring us to the gee-whiz factors associated with networks. Novell has always been a master at marketing. Microsoft's ability to not only gather 35 licensees of LAN Manager but keep everything under wraps until it decided it was showtime proved the folks in Redmond are no slouches themselves when it comes to marketing.

One of the biggies when it comes to hype is performance — that is, speed — a recurring theme in each stage of LAN evolution, including today's sprint toward OS/2 connectivity.

Vendors rave about it, but I suspect many users don't lose much sleep over it. Of course, they expect their networks to be faster than sneaker net, and server bottlenecks are a problem. But most users are not looking to drag race; they'll settle for an adequate solution tailored to their needs.

Those needs have to take into account whatever equipment and cabling morass is in use, so it's no wonder that LAN vendors and resellers have always offered users an array of software, hardware, cabling and, yes, standards.

> USERS' DESIRES are simple. They just want something that works, something that's easy to use and something that will leave them with change in their pockets.

The need for those choices will naturally spill over into the OS/2 world, which is at least a year away from a serious stab at reality.

So all the hullabaloo over Microsoft's LAN Manager vs. IBM's LAN Server vs. third-party proprietary software from Novell and Banyan is really just that.

Chances are there will be room for all three solutions. (There always seem to be at least three choices in any networking situation.) But if any one group holds the key to this dilemma, it certainly isn't the vendors.

It's the developers and the OEMs. If you are worried about Novell's future — given its current predeliction for pretty much ignoring LAN Manager proper — I suggest a poll of Novell OEMs and developers might be in order.

A number of these people have thrown their support behind LAN Manager. But with the exception of one, Excelan, no vendor has publicly backed away from Netware in an OS/2 environment. As long as developers write to both environments, or as long as Novell supports the necessary parts of OS/2 to ensure compatibility with applications written to OS/2, there's really not much to worry about.

With an estimated half of the current network nodes on its networks, Novell isn't going to fade into the sunset. It might move on to bigger and more costly networks, but it certainly isn't going to be sucker-punched by Microsoft. If necessary, Novell is capable of reversing its not-invented-here attitude. It has already reversed itself enough to announce plans to support two key LAN Manager applications programming interfaces.

True Blue

IBM, of course, is IBM and will do whatever it darn well pleases, secure in the knowledge that millions will buy whatever it is selling.

As for Microsoft, well, the LAN Manager is a significant improvement over its predecessor, Microsoft Networks. And Microsoft has succeeded in rounding up an impressive array of support for the LAN Manager, encompassing not only big-name vendors but the critical communications components necessary to compete with IBM's OS/2 Extended Edition Communications Manager.

The vendor to gain the most market share will undoubtedly be aided by a combination of when its products are available and when applications are available. As one user from a major New York bank said recently, "It all looks good on paper; we'll just have to wait and see whether any of it works."

Chase

FROM PAGE 55

to the right department through the computer system, he said. It will then convert documents to whatever format a particular department uses. "That should mean big savings," Pandullo said.

Traffic flow

Autoscreen came on-line in February and now processes 100% of incoming private network traffic with a 65% success rate. "That means it extracts the meaningful information from 65% of incoming messages," Pandullo said.

The software gives up on the remaining 35% of messages, he said, sending them on to be processed by human operators. Pandullo's group expects a higher accuracy rate after it has refined the software.

As luck would have it, shortly after Chase began developing Autoscreen, MCI Communications Corp. began offering a similar system as part of its telex transmission service. Chase uses services like MCI's as well as its own private network to transmit documents.

Saving energy

At Chase, Autoscreen will be used to process telexes that come in through Chase's private network, and telexes that come in by carrier will be processed by the carrier's system "so we don't have to expend as many processor cycles" on document scanning, Pandullo said.

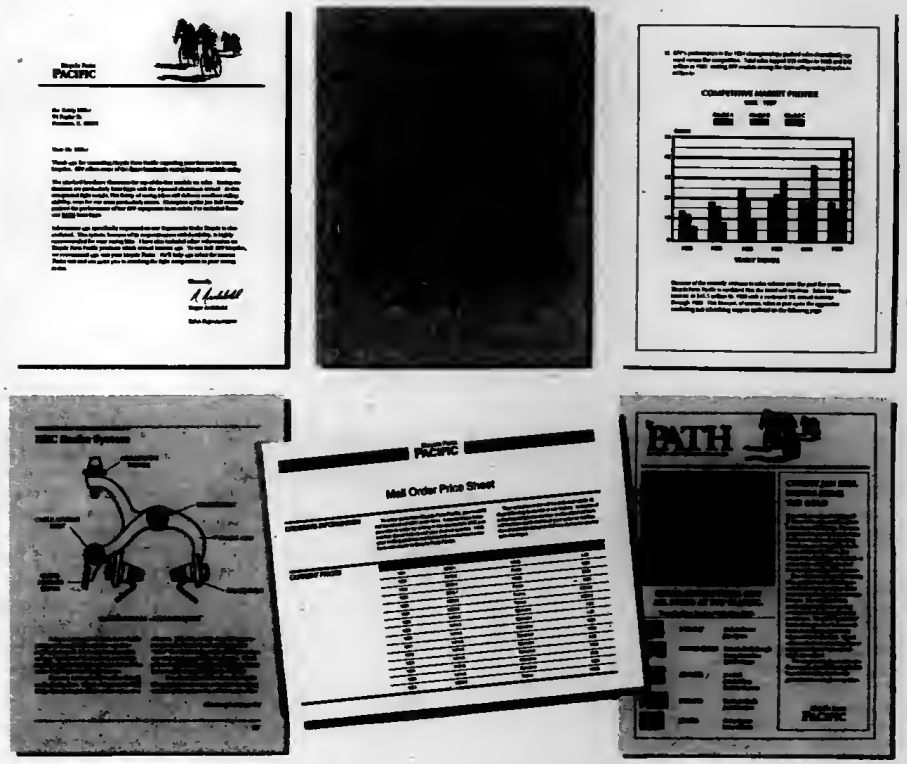
Chase is now insisting that all the telex carriers it uses provide document scanning and support the financial company's internal document formats. "I'm not going to customise Chase's system to conform to a bunch of different carriers' formats," Pandullo said.

Chase has just begun using MCI's scanning service and is looking at other carrier-based document-scanning services, such as a recently announced offering from TRT Telecommunications, Inc.

we never stop asking

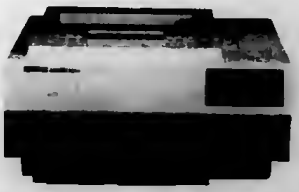
"What if..."

How to look good from start...



to finish.

The HP LaserJet Series II Printer.



Nothing brings your ideas to life like the HP LaserJet Series II Printer—from office memos to forms to newsletters. As the leading laser printer, it works with all popular PCs and PC software packages. And, with a wide range of fonts, you get more options to create superior looking documents.

With additional memory you can even print sophisticated 300 DPI full-page graphics. And with HP's ScanJet scanner, you can also easily add photographs, illustrations and text.

No wonder more people choose the original over all other laser printers combined.

So call 1 800 752-0900, Ext. 900D for your nearest HP dealer.

HEWLETT PACKARD

© Hewlett-Packard 1988

Print samples were created using Microsoft Word, Microsoft Excel, and Aldus PageMaker.

Gateway unveils Micro Channel card

BY KATHY CHIN LEONG
CW STAFF

IRVINE, Calif. — Sustaining the industry trend toward IBM Personal System/2 support, Gateway Communications, Inc. recently announced a PS/2 Micro Channel bus version of its G/Ethernet network adapter. The adapter is said to increase speed by as much as 54% over the firm's older, eight-bit Ethernet board.

During the next few months, a board of local-area network vendors are expected to roll out their versions of Micro Channel cards supporting either Ethernet or token-ring technology. 3Com Corp. has been shipping Etherlink/MC since last October, and Ungermann-Bass, Inc. is expected to follow suit soon. Novell, Inc. has announced it is supporting the 3Com Micro Channel card.

Gateway officials said the firm expects to woo new users by stressing that its card will be one of the fastest on the market. Through a special queuing algorithm and use of 64K bytes of onboard cache memory, the G/Ethernet Micro Channel Gateway can significantly increase the data transfer rate between the card and the CPU, according to Walt Schramm, vice-president of marketing.

Performance measures

"There are several ways to judge performance," Schramm said. "Before, users mainly looked at the cable rates of 10M bit/sec. for Ethernet. But users have to also look at the operating systems, the type of file server used, the kind of application that will run on the system and the adapters." He would not specify how much faster the board will run, because that rate depends on the network configuration.

Like the 3Com Etherlink/MC board, the Gateway offering will use IBM's PS/2 Programmable Option Select program feature, eliminating the requirement for DIP switches and jumpers.

According to Schramm, the company will be testing its Micro Channel boards against other vendors' cards within 30 days. In addition, it will test its boards against earlier eight-bit Ethernet versions. Schramm said Gateway will publish its findings and offer them to independent testing houses for verification.

The G/Ethernet Micro Channel Gateway will ship to dealers and distributors this week and will support only Novell's Netware network operating system, the vendor said. Priced at $525, it supports standard and thick Ethernet RG-58 cable. Plug-compatible with networks from 3Com, Novell, AST Research, Inc. and Western Digital Corp., it can be used to extend other vendors' networks.

"We are expecting that the PS/2 Model 80 in particular will serve as an excellent file server to support users' multitasking needs. Now what we need to see are more applications to take advantage of [Microsoft Corp.'s] OS/2," Schramm said.

In addition, Gateway will soon be shipping its token-ring adapter cards. Although Schramm would not specify the ship date, he indicated that other related token-ring announcements will be made.

EDI

FROM PAGE 55

from there, leverage those accounts into EDI systems where they can avail themselves of other applications, such as electronic mail, IBM's Professional Office Systems and Distributed Office Support Systems and data base access.

"Once host-attached, it is much, much easier to sell other value-added services," observed Michael Ribet, manager of the marketing support program for IOS.

Or, more simply put, "he who controls the customers' connection really controls the accounts," Ribet added.

Initially targeting 37 IBM plants and their top 2,000 suppliers as EDI Services candidates, IBM signed on 750 customer sites in the first quarter. IBM itself expects to reap $60 million in savings by 1992 under this plan. "We will not be the shoemaker's children," said Bruce Jackson, manager of IOS marketing and support.

With 20 pilots already under way with market leaders, IBM will spend the next 90 days implementing those orders. The third quarter will be spent cementing these "electronic partnerships."

No question about it, IBM is "very excited and very serious" about its EDI Services offering, Pickerill said, adding that it was first announced in December 1985. It is so serious that s closer look at the waves of structural reorganizations sweeping IBM during the last six months reveals a boost to EDI marketing efforts.

Pushing Information Network and EDI is the concept of IOS, which involves networks linking separate enterprises. "We've yet to find s company unreceptive to IOS," said Jackson, adding EDI is the "leading iceberg in IOS."

Effective Jan. 1, IBM combined product marketing and marketing support for EDI and IOS into one organization, reporting to Jackson. This month, IBM announced a new line of business called Applications Solutions, which reports to Ned Lautenbach, an IBM vice-president and general manager of the Application Solutions Division. It has four functions, among them Information Network. "This shows the importance that IBM puts on what we do," Pickerill said.

IBM's EDI view

EDI truisms that have not escaped IBM's attention, nor reaction, include the following:

- Business, not technology, is driving EDI, as users begin to realize the savings in labor, time, error reductions and other cost-efficiencies available to them via EDI. IBM expects that senior management will continue to recognize the value of EDI, even in tough economic times.
- The service element is more important then the technology, especially among smaller businesses. IBM is recruiting developers with vertical EDI packages for its Marketing Assistance Program — four so far this year.
- Many trading partners will be "coerced" into adopting EDI systems by major buyers. IBM will work with customers seeking to convert business partners to an EDI system.
- As the lines between industries blur, most users will have to deal with more than one EDI format. As such, IBM supports s number of industry EDI formats and has embarked on a campaign of forging alliances in specific industries, including hospital supply and independent insurance agents.
- Many would-be EDI participants do not have SNA networks; in some cases, they may not even be automated. In a recent interview st Information Network headquarters in Tampa, IBM officials repeatedly guaranteed support for non-SNA and non-IBM devices — for example, via non-SNA IBM RJE connections. "Whatever equipment they have, they should be able to use on our EDI," Ribet said.
- The needs and requirements of suppliers and vendors are roughly equivalent. "We've yet to find a significant difference in the statements of direction of EDI needs and requirements between customers and our suppliers," Ribet added.
- ANSI's X.12 data format standard has emerged as the dominant U.S. EDI standard. IBM announced X.12 support in December. Internationally, IBM relies on SNA and X.25 links. As for CCITT's X.400 standard, "it is still evolving. We don't see anything there yet," Ribet said.

COS releases conformance test system

MCLEAN, Va. — The Corporation for Open Systems (COS) has released its Open Systems Interconnect Message Handling Systems Conformance Test System.

COS is an international research and development consortium of more than 60 manufacturers and users focused on systems that tests conformance to international standards.

COS said it is moving to fill existing orders for the test system from vendors planning to sell and exhibit Message Handling Systems products in connection with the Enterprise Networking Event '88 International, set for June 5-9 in Baltimore.

Stacking up

Comparing its conformance test with other X.400 testing systems, COS claimed its system includes a full suite of test cases, more favorable licensing terms, international support capability and COS Mark Program compatibility.

Also, COS said it will release its File Transfer, Access and Management (FTAM) Test System, designed to monitor FTAM's conformance with international standards, later this month.

The U.S. government and other large information technology users will be requiring OSI conformance testing as part of their procurement process, COS said.

Betts

FROM PAGE 55

vices are regulated, by replacing the traditional rate-of-return regulation with Patrick's price caps. This one's going nowhere fast, because of pervasive skepticism in Congress and in the industry.

Down on his luck

Patrick's political standing is so low in Congress that be can't even get the Senate to schedule confirmation hearings for nominees to fill two vacant seats on the commission.

It's surprising that so much could go wrong for Patrick, who is personable, smart, young and ambitious. All three proposals are intellectually honest attempts to regulate in the public interest.

What went wrong is that Patrick picked the wrong agenda. He took on projects that be couldn't possibly finish before the next presidential administration. Worst of all, be picked projects that generate more angry opponents than supporters — and even the supporters are lukewarm — without demonstrating that the measures will have big benefits.

In the two access-charge cases, Patrick spent scarce political capital on projects that will produce only minuscule revenues for the local exchange coffers. And, there was no burning crisis in access charges that needed resolving.

Concerning the price caps initiative, there may be some merit to replacing rate of return as the focus of AT&T regulation. But Patrick failed to lay the all-important intellectual and political foundation for making such a fundamental change in policy.

Whatever you may think of the Tax Reform Act of 1986, it was a major overhaul of the tax code that was accomplished only after years, not months, of political groundwork by its supporters. This means a steady stream of research studies and conferences by think tanks, press coverage of horror stories, coalition building, public speeches, hearings, meetings and compromises with Congress.

Patrick can be commended for starting the dialogue on alternatives to rate-of-return regulation, but be should have waited to start the official FCC proceeding until the issue had ripened.

It's especially disappointing that Patrick chose such an unproductive agenda, because be had such s good one staring him in the face. And be still does: make the Third Computer Inquiry work.

Breaking ground

The Third Computer Inquiry is a whole new, untested regulatory structure for AT&T and the regional Bell holding companies, allowing them to offer an array of enhanced telecommunications services, unfettered by requirements for separate subsidiaries.

Congress and U.S. District Judge Harold Greene, along with the telecommunications industry, are watching to see if the FCC can pull this off. It's not s sure bet. Success will require, aside from good faith and honesty by the former Bell companies, aggressive efforts by the FCC to ensure that the accounting rules and Open Network Architecture really work to discourage anticompetitive behavior.

It may not be as glamorous as launching new initiatives, but this agenda is far more important. Too bad Patrick has already used up his political capital.

Betts is *Computerworld's* Washington, D.C., correspondent.

Every presenter wants to make a compelling, persuasive case. And color, you'll agree, makes all the difference. It's more eye-catching. More readily understood. More memorable. In short, color makes any desktop presentation more effective. And research proves it.

All you need is a Hewlett-Packard ColorPro Plotter like we used here, or the HP PaintJet Color Graphics Printer. Together with a PC—IBM compatible or Apple Macintosh—you can use all the popular graphics software like Lotus Freelance Plus, Cricket Presents, HP's Graphics Gallery (used below), Microsoft Chart and Harvard Graphics.

At under $1,300, the HP ColorPro Plotter may be just where you want to start. It will turn your ideas into colorful, easy-to-grasp visuals. Or, if you need to combine near-letter quality text with color graphics, you can rely on the HP PaintJet Color Graphics Printer for under $1,400. Whichever you choose, you'll create desktop presentations with startling color and greater impact.

For a colorful sample overhead and the name of your nearest dealer, call 1 800 752-0900, Ext. 903A.

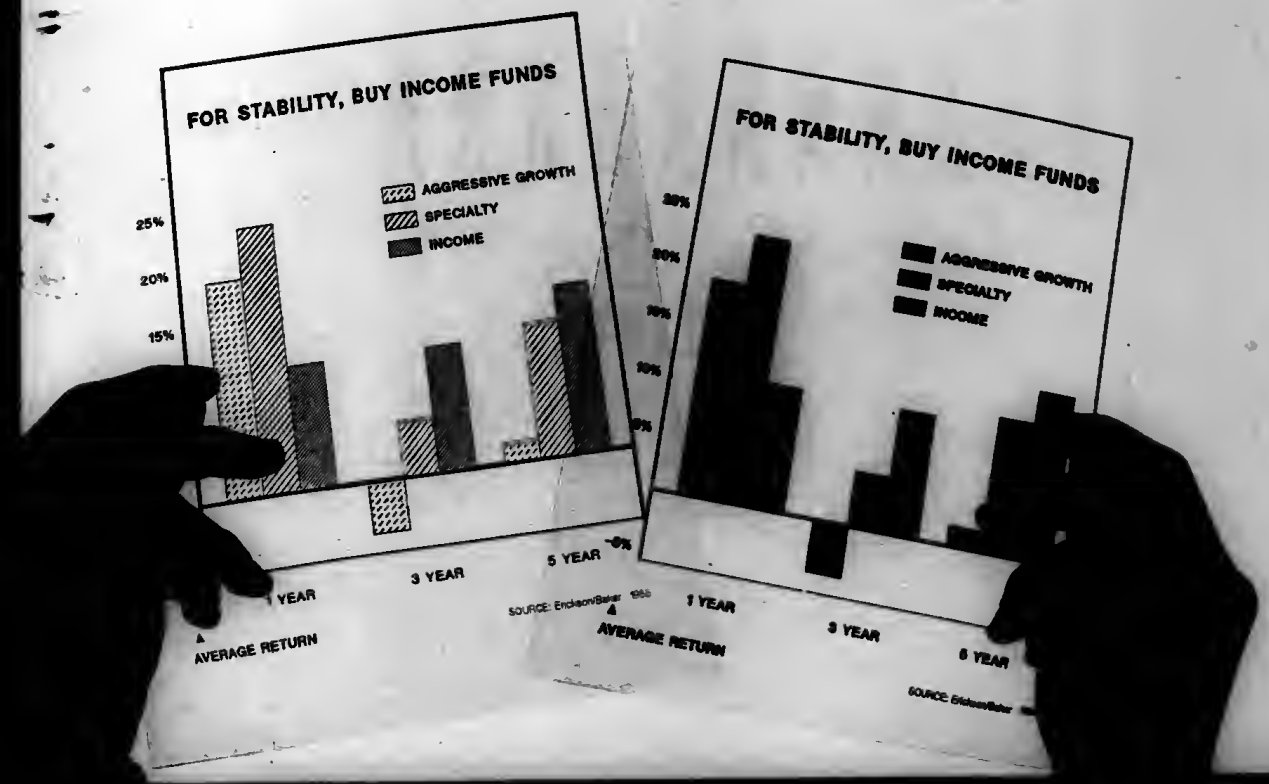
Freelance Plus® and Lotus® are U S registered trademarks of Lotus Development Corporation. Microsoft® is a U S registered trademark of Microsoft Corporation

© Hewlett-Packard 1988

HEWLETT PACKARD

stop asking "What if..."

Guess which presentation made the sale.



NEW PRODUCTS

Local-area network hardware

An eight-channel dual-line data compression system has been announced by Symplex Communications Corp.

The Symplex Datamizer II SDC-8E is said to automatically sustain network sessions and response times despite leased-line degradation or failure. Features include peak-load leveling, the ability to accept an aggregate input ranging up to 76.8K bit/sec., compatibility with most synchronous and asynchronous networking protocols and the ability to operate with a different protocol and speed on each channel.

The Datamizer II SDC-8E costs $9,750 in rack-mount configuration and $9,950 in a stand-alone enclosure.

Symplex, 5 Research Drive, Ann Arbor, Mich. 48103. 313-995-1555.

Network management

A communications package for IBM's System/36 has been announced by Kisco Information Systems.

The software, called Remote Batch Control/36, includes a remote batch job feature that can start any batch job on a remote system, a printer pass-through feature that can route printed output to any attached System/36 and support for file and program transfer between machines.

The software requires the SSP communications feature from IBM on all attached machines. Peer System/36s can be attached over permanent or dial-up connections.

The package costs $300 for two sites. Additional sites cost $50 each.

Kisco, Suite 1B, 120 Beverly St., Mount Kisco, N.Y. 10549. 914-241-7233.

A software emulation of its Communication Management Series (CMS) network diagnostic terminal for IBM Personal Computers has been announced Racal-Milgo.

According to the vendor, when CMS PC-Link software is loaded into a PC, the user has full color access to CMS. In addition to providing CMS network diagnostic, control and restore functions, CMS PC-Link can also be configured to support a second port. It also supports color printing on Tektronix, Inc. printers or Diablo Systems, Inc. color ink-jet printers.

Available in both 3½- and 5¼-in. diskettes, CMS PC-Link costs $1,500.

Racal-Milgo, 1601 N. Harrison Pkwy, Sunrise, Fla. 33323. 305-475-1601.

Modems/Multiplexers

Paradyne Corp. has added models to its 3400 Series Network Diagnostic Modem family.

The modems feature interchangeable Personality modules that supply operating characteristics such as data rates. The modems are available in three configurations: desktop models, with a time-division multiplexer, a modem-sharing device and dial restoral; nest-mount models with the ability to support up to 48 modems; and desktop models, suited for remote multidrop configurations.

The Personality modules available support data rates from 1,200 to 9.6K bit/sec. over unconditioned leased lines.

Pricing ranges from $1,400 to $4,500.

Paradyne, P.O. Box 1347, 8550 Ulmerton Road, Largo, Fla. 33540. 813-530-2000.

A point-to-point time-division multiplexer called the Megaplex-1 has been introduced by Rad Data Communications.

Megaplex-1 is said to be capable of multiplexing 10 synchronous subchannels, expandable to 20, into a single T1 or 2M bit/sec. channel. The product operates over microwave links and provides any port-to-any port routing via front panel controls.

Selectable subchannel data rates range from 56K to 768K bit/sec. Field-selectable subchannel interfaces include V.35, X.21 and RS-422. The main channel interface is compatible with AT&T's T1 CSU cross-connect interface requirements.

The Megaplex-1 costs $4,500 with 10 subchannels or $5,900 with 20 subchannels.

Rad Data Communications, 151 W. Passaic St., Rochelle Park, N.J. 07662. 201-587-8822.

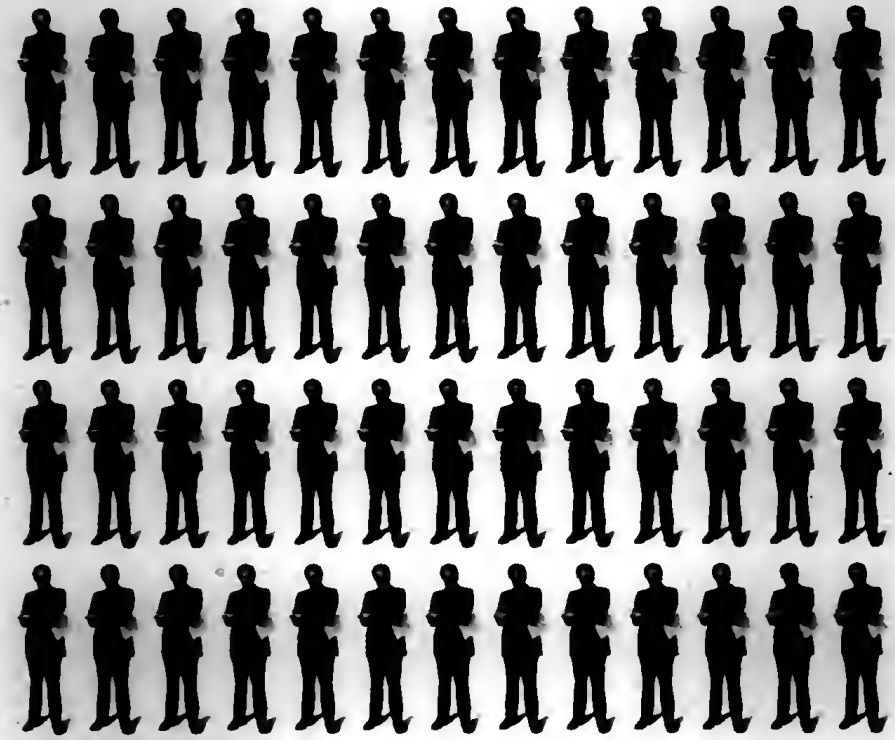
Siemens Information Systems, Inc. has announced two data communications interfaces and software designed to expand the personal computer networking and data communications capabilities of its Saturn II, IIE and III digital voice and data systems.

The interfaces, one internal and one external, allow transmission of data in synchronous or asynchronous protocols. They can emulate a Hayes Microcomputer Products, Inc.-compatible modem.

The OC III software supports synchronous data communications at speeds to 64K bit/sec. and asynchronous transmission between Saturn systems at up to 19.2K bit/sec. over T1 facilities.

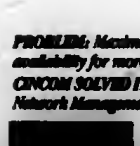
OC III costs $1,000; the external interface costs $500; and the internal interface costs $250.

Siemens, 5500 Broken Sound Blvd., Boca Raton, Fla. 33487. 305-994-8100.



CINCOM Keeps Northwestern Mutual In Full Force.

PROBLEM: Maximizing network availability for more than 8,000 users
CINCOM SOLVED IT: With NETMASTER Network Management System



Mr. Wayne Gajkowski, Senior Systems Analyst
Mr. George MacDonald, VTAM Specialist
Northwestern Mutual Life Insurance Co.

When Northwestern Mutual Life's network goes down, it hardly goes unnoticed. In fact, with more than 2,000 home-office employees and nearly 7,000 field agents depending on the network for up-to-the-minute policy information, it becomes an event of major proportions.

Which is exactly why NETMASTER™ from Cincom® has become such a valuable asset to "The Quiet Company." "NETMASTER has made life much easier from a network control point of view," explained Northwestern Mutual's Wayne Gajkowski. "It definitely keeps the network more available. For example, in one instance, it helped us eliminate a problem with NCP slowdown, which had caused considerable downtime—as much as two hours a week or more."

Driven by a powerful Network Control Language, NETMASTER not only helps decrease downtime, it helps cut costs at Northwestern Mutual. As VTAM Specialist George MacDonald points out, the system's multiple monitors capabilities have allowed his company to delay hardware purchases and, in many cases, hardware upgrades as well as improve productivity. "I wouldn't want to have to manage a network like ours without something as high quality as NETMASTER," said MacDonald, whose company also utilizes SUPRA™ and MANTIS® from Cincom. "There's just no way in the world to do it."

Find out why NETMASTER is the best policy for your network, too. Call us today for more product and customer-success information, or write Marketing Services Department, Cincom World Headquarters, 2300 Montana Avenue, Cincinnati, OH 45211.

1-800-543-3010
In Ohio, 513-661-6000
In Canada, 1-800-387-5924

CINCOM®
The Better The Solution, The Better The Value.℠

© 1988, Cincom Systems, Inc.

BEST COPY AVAILABLE

We Laughed When You Sent Us Your Button Contest Entries!

Announcing the Winners of the 1988 Computerworld Button Contest.

When we challenged you in March to make us laugh, we were looking for humorous slogans for our annual button contest.

We got them.

Your response was impressive, to say the least. And your slogans were terrific. We received hundreds of responses from all over the United States. They were all quite good, so choosing just six winners was no easy task.

But it was enjoyable. Our panel of Computerworld judges was thoroughly entertained by your creativity.

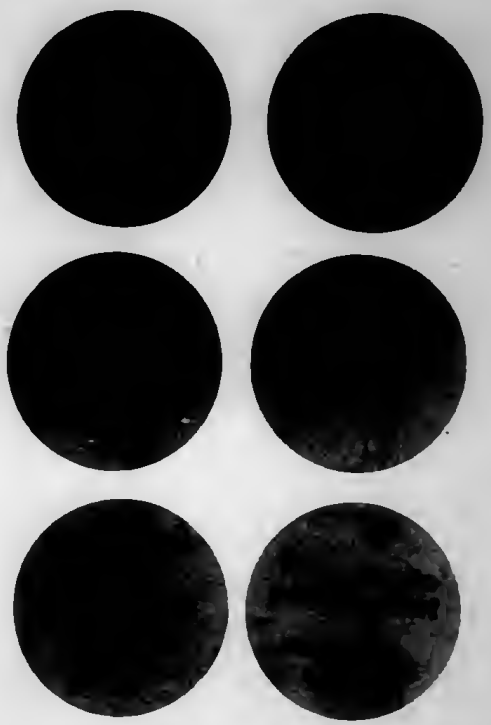
Be sure to look for these buttons at upcoming trade shows and conferences — the 1988 buttons will debut at Comdex Spring, May 9-12, so stop by the Computerworld booth and pick up yours.

Congratulations to the winners and many thanks to all who entered. We'll see you again next year!

COMPUTERWORLD

An IDG Communications Publication

The Winning Slogans of the 1988 Computerworld Button Contest:



SEE US AT COMDEX - BOOTH #1214

TelOAS From TeleVideo. Open Architecture Solutions.

When Dr. K. Philip Hwang founded TeleVideo in 1975, he began a company that would never cease searching for solutions to the needs of customers. The new TelOAS open architecture computer systems are the latest in a long line of those solutions.

TelOAS is more than a computer system. It's a new way of looking at solving your computer needs. TeleVideo engineers created a system that can be anything you need it to be. From a data entry terminal to a powerful CAD/CAM workstation to a LAN fileserver, TelOAS combines power and flexibility in a system every user can afford.

TelOAS protects your investment by combining the latest technology with industry standard hardware and software. To give you added assurance, standard TelOAS models include one-year limited ON-SITE warranty* service from Intelogic Trace with over 250 service locations. All standard TelOAS models come bundled with MS-DOS™ and BASIC to give you access to the widest range of software available. It's all there to make sure TelOAS open architecture systems will meet your needs today, and grow in the future.

*U.S. only

Standard TelOAS Configurations Matrix

Product	Model	CPU/ Speed	Standard RAM	No. of Slots	Floppy	Hard Disk	Keyboard	Video Board	Monitor	Power Supply
TelOAS I	NH	88/8	512K	4	360K	Optional	AT	MD/Her/CGA	Optional	80W
TelOAS II	NH	286/12	1M	8	1.2M	Optional	Enh. AT	Optional	Optional	155W
TelOAS II	20	286/12	1M	8	1.2M	20M	Enh. AT	Optional	Optional	155W
TelOAS III	NH	386/16	1M	12	1.2M	Optional	Enh. AT	Optional	Optional	240W
TelOAS III	40	386/16	1M	12	1.2M	40M	Enh. AT	Optional	Optional	240W
TelOAS III	70	386/16	1M	12	1.2M	70M	Enh. AT	Optional	Optional	240W
TelOAS III/20	NH	386/20	1M	12	1.2M	Optional	Enh. AT	Optional	Optional	240W
TelOAS III/20	70	386/20	1M	12	1.2M	70M	Enh. AT	Optional	Optional	240W

TelOAS I. Flexibility Is The Heart Of The System.

The key to the new TelOAS Open Architecture Solutions is being able to build the computer that's right for your applications. Our modular design lets you choose the TelOAS CPU you want: an 8 MHz 8088, a 12 MHz 80286, or your choice of a 16 or 20 MHz 80386. Now choose the drives you want, the monitor, keyboard, and the footprint you want. Then combine them in the configuration that gives you the solution you need. When your needs change, the TelOAS system changes right along with you.

We didn't forget that even the most flexible system has to work in the real world, so we made sure the TelOAS system is compatible with industry-leading software to give you access to the most versatile and powerful programs.

TelOAS I packs a lot of power and versatility into a very compact 4" high package. Its open-architecture passive backplane design gives it great flexi-

bility. The passive backplane has four full slots (three 16-bit and one 8-bit) and room for two half-height drives. To make your connections, there's one serial and one parallel port.

To keep everything safe and sound from unauthorized use, there's a convenient front-mounted security lock with removable key.

There's also a LED On-Off power switch/reset key that falls right at hand. A small point, but an indication of the care TeleVideo engineers took designing our most advanced system ever.

The standard TelOAS I configuration includes an 8088 CPU, 512K RAM, 360KB floppy disk drive, floppy disk controller, Hercules®/CGA graphics controller and 84-key AT compatible keyboard. It's shown here with the optional high-resolution 14" amber screen monitor.

TelOAS II. Advanced Technology Is The Brain Of The System.

The TelOAS Open Architecture Solutions use some of the most advanced design and assembly technologies to deliver computers that are as dependable as they are powerful.

TelOAS advanced passive backplane technology makes it easy to upgrade your system as your needs change. Increasing memory can be as easy as plugging in a new TelOAS Single Inline Memory Module (SIMM). Slip out your half-height drives, slip in full-height hard disks and you can have to up 300 MB storage capacity, enough to run sophisticated System Fault Tolerant backup systems and LAN configurations.

Our Surface Mount Technology (SMT) increases the functionality and reliability of TelOAS computers, and decreases their

power consumption.

And that's enough to make even a power user smile.

TelOAS II increases your flexibility with a choice of TelOAS 12 MHz 80286 or 16 MHz 80386 CPUs, plus a socket for an 80287 or 80387 coprocessor. The passive backplane has eight full slots (seven 16-bit and one 8-bit), and room for four half-height drives. There are two serial and one parallel port, a security lock with removable key, and a LED On-Off power switch/reset key.

The TelOAS II standard configuration includes a 12 MHz 80286 CPU, 1 MB RAM, 1.2 MB floppy disk drive, floppy and hard disk controllers, and 101-key Enhanced AT keyboard. We've shown it here with an optional 13" color monitor.

While TeleVideo's engineers were designing our most powerful and most flexible computer system ever, they made sure it was also the most reliable.

TelOAS Open Architecture Solutions use the most advanced design and production technologies to reduce the number of parts in each system, and to make sure each of those parts maintains our stringent quality control requirements.

To make sure our computers remain very reliable and trouble-free, each TelOAS system has complete diagnostic features that give you extensive hardware tests.

TelOAS III is the top of the line, perfect for users who expect a lot from their computers. Unique for TeleVideo, TelOAS III can be configured to support up to 600 MB, giving users the capability to run large disk storage programs, LAN configurations and System Fault Tolerant back-

TelOAS III. The Best Solutions Are The Most Reliable Solutions.

up systems, as well as powerful CAD/CAM engineering workstations.

TelOAS III accepts TelOAS 12 MHz 80286 and both 16 MHz and 20 MHz 80386 CPUs. There's a socket for a 32-bit memory expansion connector, and an 80387 coprocessor. The 20 MHz 80386 CPU also accepts a Weitek™ 1167 floating-point processor. The passive backplane has eight full-size and four half-size slots (ten 16-bit and two 8-bit), and room for two full-height and two half-height drives.

There are two serial and one parallel port, and a LED On-Off power switch/reset key.

The TelOAS III standard configuration includes a 16 MHz 80386 CPU, 1 MB RAM, 1.2 MB floppy disk drive, floppy and hard disk controllers, and 101-key Enhanced AT keyboard. It's shown here with an optional 19" high-resolution color monitor.

TeleVideo has the perfect terminals to go with our TelOAS Open Architecture Solutions.

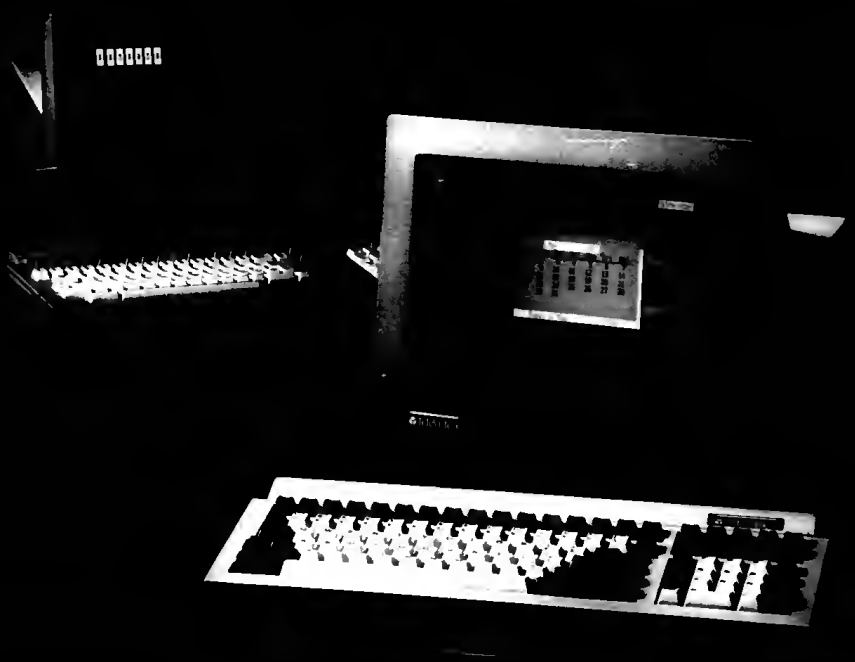
The affordable 905 is a very reliable ASCII terminal with all the basic features you look for in a data-entry terminal, priced with maximum economy in mind.

The bright new 900C color terminal lets you bring all the benefits of color to your monochrome applications. Just plug it in to take advantage of its 64-color palette and 14" non-glare screen.

The powerful 965 is perfect for just about everything. With an Enhanced PC keyboard, it's a low-cost workstation for your TelOAS system running DOS. As an ASCII or ANSI terminal with the corresponding keyboard, you can use it on your TelOAS system in a UNIX® multi-user configuration.

The 965 uses an ultra-reliable single board design with a 16-bit

TeleVideo Terminals. The Perfect Additions To A TelOAS System.



CPU and sophisticated gate array to give you all the power you need. Its 14" high-resolution flat screen displays up to 49 data lines to show large spreadsheets or two pages of text at a time. That's more than any other terminal in its class. It also supports up to 23 terminal emulations, again more than anything in its class.

And the 9320 is a DEC® VT320™ compatible terminal with more flexibility and features than the VT320. It has DB25 and DECconnect™ host and printer ports, two pages of display memory, and an enhanced VT320 keyboard.

All TeleVideo terminals come complete with TeleVideo's full one-year limited end-user warranty.

Which is just one more reason why TeleVideo terminals are the perfect choice.

Open Up All Kinds Of Possibilities With TeleVideo. Call 1-800-835-3228. Or,

☐ Please send me more information on the new TelOAS Open Architecture Solutions
☐ Please send me more information on the complete line of TeleVideo terminals

Name_____

Title_____ Telephone_____

Company_____

Address_____

City, State, Zip_____

Our company is an ☐ OEM ☐ VAR ☐ Distributor ☐ End User

Mail to TeleVideo Systems, Inc
1170 Morse Avenue, Sunnyvale, CA 94088-3568

TeleVideo®
THE VISION YOU NEED TO SUCCEED.

We Laughed When You Sent Us Your Button Contest Entries!

Announcing the Winners of the 1988 Computerworld Button Contest.

When we challenged you in March to make us laugh, we were looking for humorous slogans for our annual button contest.

We got them.

Your response was impressive, to say the least. And your slogans were terrific. We received hundreds of responses from all over the United States. They were all quite good, so choosing just six winners was no easy task.

But it was enjoyable. Our panel of Computerworld judges was thoroughly entertained by your creativity.

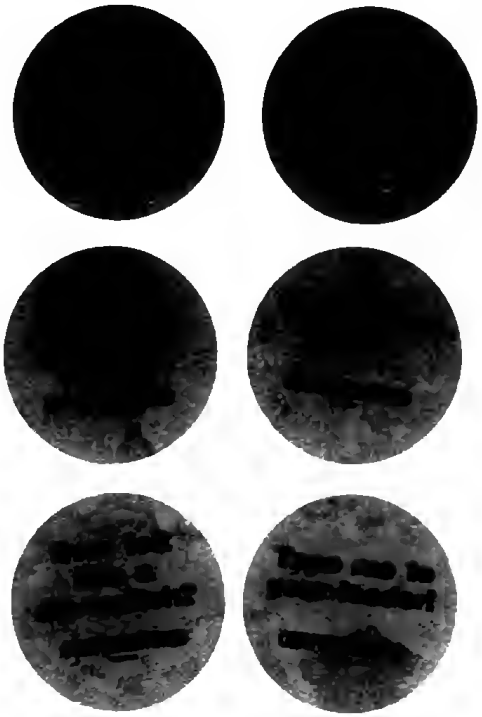
Be sure to look for these buttons at upcoming trade shows and conferences — the 1988 buttons will debut at Comdex Spring, May 9-12, so stop by the Computerworld booth and pick up yours.

Congratulations to the winners and many thanks to all who entered. We'll see you again next year!

COMPUTERWORLD

An IDG Communications Publication

The Winning Slogans of the 1988 Computerworld Button Contest:



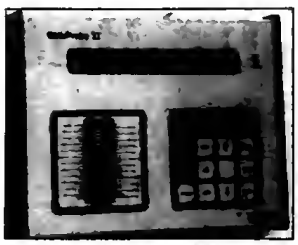
SEE US AT COMDEX - BOOTH #1214

Diagnostic equipment

A protocol analyzer and emulator designed for installing and maintaining data communications networks has been announced by **Control Systems Technology, Inc.**

Dataprobe II can capture or generate data at up to 19.2K bit/sec. It features a battery backed-up 30K-byte capture buffer that can be dumped to a computer or printer. Protocols available include Async; IBM's Binary Synchronous Communications, Synchronous Data Link Control, Systems Network Architecture and high-level data link control; and CCITT X.25.

Other features include dual-line auto-



Control Systems' *Dataprobe II*

configuration, the ability to determine and display protocol, data rate, clocking and other link parameters for both the data terminal equipment and the data communications equipment device simultaneously.

Dataprobe II models are priced from $1,695 to $1,995.

Control Systems Technology, 19045 Cherry Bend Drive, Germantown, Md. 20874. 301-540-8614.

Coax Data Scope, a product designed to support IBM 3270 Personal Computer Systems Network Architecture (SNA) networks, has been announced by **Azure Technologies, Inc.**

Consisting of a personal computer board and software, Coax Data Scope converts an IBM PC AT or XT into a data scope for use in monitoring and analyzing IBM's Type A coaxial protocols and the data streams that are transmitted using the coaxial medium.

According to the vendor, Coax Data Scope supports all modes of operation. It allows the data to be viewed in any of the protocol levels allowed on the SNA medium. The protocols can be displayed simultaneously in user-defined windows. The product also allows the capture of data files up to 16M bytes.

Coax Data Scope is priced at $2,995.

Azure Technologies, 38 Pond St., Franklin, Mass. 02038. 617-520-3800.

Cabling

A half-card-size personal computer board said to allow PCs to transmit over fiber-optic cable has been introduced by **Black Box Corp.**

The **Fiber Optic PC Boards** are available with one or two programmable full-duplex channels. Once installed, the vendor said, transmission up to 2.5 miles is possible at rates of up to 76.8K bit/sec.

The single-port model costs $255; the dual-port model costs $320.

Black Box also introduced the **Tote-A-Modem**, a portable, battery operated modem. It features Hayes Microcomputer Products, Inc. AT command set compatibility, autoanswer, autodial, pulse and tone dialing and storage of up to 20 commands. The 1,200 bit/sec. model costs $199; the 2,400 bit/sec. model costs $359.

Black Box, P.O. Box 12800, Pittsburgh, Pa. 15241. 412-746-5500.

An IBM Token-Ring local-area network fiber-optic extender has been announced by **Raycom Systems, Inc.**

An enhanced version of the Raycom 3400, the **Raycom 3410** was designed for networks operating from 1M to 16M bit/sec. with Manchester coding.

Distances can be extended up to 4 km using common multimode fiber-optic cable.

The Raycom 3410 reportedly allows attachment to the IBM Multistation Access Unit's Ring In and Ring Out ports in addition to attachment to the unit's eight lobe ports.

Support is provided for redundancy, the vendor said.

The Raycom 3410 is priced at $1,415. An extended distance version, which operates over single-mode fiber, is available for $2,265.

Raycom Systems, 6395 Gunpark Drive, Boulder, Colo. 80301. 303-530-1620.

An I/O module designed to extend an IEEE 802.3 IBM Token-Ring network over optical fiber at a data rate of 4M bit/sec. per channel has been introduced by **Fibermux Corp.**

The **CC4465T** is part of the vendor's Magnum FX4400 I/O module line. It is an eight-partition, 40M bit/sec. aggregate bandwidth fiber-optic backbone network, reportedly allowing up to eight independent token-rings to run over a single fiber pair.

According to the vendor, the network can be extended up to 10 km.

Features include on-line testing and remote failure detection. Optional features include optical redundancy, switchover logic and network management software.

An FX4400 configured with the CC4465T Token-Ring support ranges from $4,500 to $15,000.

Fibermux, 9428 Eton Ave., Chatsworth, Calif. 91311. 818-709-6000.

"Obviously, these people never considered the advantages of incorporating planned rentals into their capital equipment acquisition strategy."

LEASAMETRIC

Data Communications

For more information on renting, leasing and buying PCs, peripherals and network products, call the nearest Leasametric office. We'll show you all the advantages we offer, including the most professional service and maintenance in the industry.

Northwest: (800) 343-7368, (415) 574-5797 • Southwest: (800) 638-7854, (818) 708-2669 • Central: (800) 323-4823, (312) 595-2700
Northeast: (800) 221-0246, (201) 825-9000 • Southeast: (800) 241-5841, (404) 925-7980

© Leasametric, Inc. 1988

HARD TALK

J. A. Savage

Truth beats vaporware

Amazing things happen when reporters get to speak with computer company officials without the regulation flock of public relations people hovering over every word. Once in a while, a comment with the ring of truth leaks out.

It came as a pleasant surprise when, during the announcement of his firm's supercomputer division, David Evans — chairman, president and chief executive officer of Evans and Sutherland Computer Corp. — said there is a chance that the company's high-powered processor may not work out.

Evans and Sutherland aims to ship the graphics supercomputer at the end of this year. The vendor claimed it will be 15 times more powerful than recently announced graphics supercomputers by Ardent and Stellar and even claimed it to be more powerful than a Cray supercomputer.

Company officials said their machine will be priced in the $3 million to $8 million range, depending on configuration.

"It's conceivable that we can't do it. And it's conceivable

Continued on page 70

Vendors weather stormy rates

Amdahl, NAS insulate users from impact of yen-dollar turbulence

BY J. A. SAVAGE and STANLEY GIBSON
CW STAFF

Despite facing the threat of profit margin erosion because of the current yen-dollar exchange rate, IBM plug-compatible manufacturers (PCM) Amdahl Corp. and National Advanced Systems (NAS) thus far have shielded their customers from higher prices.

The dilemma faced by Amdahl and NAS is simple: The less the dollar is worth, the more dollars they must spend on computer components from their Japanese suppliers, Fujitsu Ltd. and Hitachi Ltd. Paying higher prices for parts threatens to force the vendors to charge their customers more.

In the IBM plug-compatible mainframe market, the ability to undersell IBM is crucial. The free-falling dollar has caused both Amdahl and NAS to scramble for creative strategies to deflect the pricing damage that the exchange rate could cause.

"We expected it [a price increase], but we haven't noticed anything yet," said Don Breitenbach, vice-president of MIS at American Family Mutual Insurance Co. in Madison, Wis.

An Amdahl user since 1979, American Family purchased one 5890 in late 1987 and another early this year. He said the prices, which were settled in October 1987, reflected the usual cost advantage over IBM.

A government user reported that he has not yet seen a change in the current exchange rate because his contracts are locked in for five to seven years, and none have expired recently.

"I would expect to see it in the next round" of requests for proposals, he said.

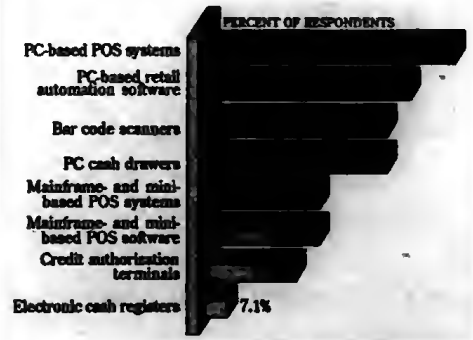
Both PCMs have come up with different approaches to the problem. Amdahl is now depend-

Continued on page 71

Data View

PCs gain at point of sale

Personal computer POS products dominate systems sold by value-added resellers surveyed



INFORMATION PROVIDED BY VENTURE DEVELOPMENT CORP.

HP airs new interface

BY STANLEY GIBSON
CW STAFF

PALO ALTO, Calif. — Responding to user demands for standard peripherals interfaces, Hewlett-Packard Co. recently introduced its first small computer systems interface (SCSI) cards and disk drives. The products are intended for the HP 9000 Series 300 technical workstation family.

"Major users want a standard interface, such as SCSI. The greatest user demand was for those workstations," an HP spokesman said.

The SCSI provides standard

Continued on page 70

Okidata builds on print line

BY ALAN ALPER
CW STAFF

NEW YORK — Okidata Corp. last week expanded its family of dot matrix printers by unveiling 24- and nine-pin units that feature ruggedized designs and a variety of paper handling capabilities designed to meet most business applications.

The new printers' cases and chassis are made from a proprietary composite of materials that are used in high-stress applications, such as safety helmets and automobile bumpers, the Mount Laurel, N.J., company said. The printers are also equipped with a printhead made from a proprietary carbide alloy said to print almost 200 million characters during its lifetime.

All of the printers carry a mean time between failure rating of 5,000 hours, which is 25% better than the firm's competition, claimed Edward Golderer,

Continued on page 68

Inside

- Stellar inks distributor pact with Tokyo-based Mitsui. Page 68.
- Storage Technology offers more tape for less money. Page 70.
- EMC reveals Prime-compatible memory card. Page 72.

▶ IBM 3270 and System 3X Users:

100% IBM 4224 Compatible!

▶Available Now!

With the plug-compatible ISI 7224, you can print everything an IBM 4224 can print and more.

7224

Speeds reach 400 cps draft. You can also print graphics, bar codes, and oversize characters without GDDM, BGU, or other special software. Output can be in black or up to eight colors.

Fully integrated (no box!), the ISI 7224 connects directly to IBM 3174/3274/3276 controllers or S/3X twinaxial cable.

Forms-handling advantages include automatic paper parking, no-waste demand-document tear-off, and a straight path for stiff forms. No extra-cost gadgets are required.

Extra features and all, the ISI 7224 costs much less than its IBM counterpart.

For more information, call 1-800-544-4072 (in Michigan, 313/769-5900). Or write.

Interface Systems, Inc.

Printer Solutions for IBM Systems

5855 Interface Drive, Ann Arbor, MI 48103
Telex 810-223-6058

▶ The ISI 7224 prints at 53.7 dBA — quieter than the IBM 4224. And since it's only seven inches tall, it fits tighter spaces.

HARDWARE NOTES

Stellar chipping at trade imbalance

Laying the groundwork so that it may play its part in reversing the U.S.-Japan trade imbalance is Stellar Computer, Inc., which recently announced that it has signed a distributor agreement with Mitsui & Co. in Tokyo. This follows Stellar's recent announcement of a distributor agreement with Asahi Chemical Industry Co. as Stellar's industrial distributor in Japan.

And Stellar will not just be returning Japanese chips to their point of origin. The custom-built microprocessors that are the heart of Stellar's GS 1000 graphics superworkstation are made by California's LSI Logic Corp.

ETA Systems, Inc. recently reported some success in placing its supercomputers. The St. Paul, Minn.-based subsidiary of Control Data Corp. has signed a $7 million contract with the National Aeronautics and Space Administration's Ames Research Center in Mountain View, Calif.

Under the agreement, NASA will lease an Initial Computer System for one year with an option to lease an ETA HSP-2 system for two years after that.

The total value of the contract, including money to be paid for both processors and hardware upgrade options, is $40.5 million. The Initial Computer System will be capable of more than 250 million floating-point operations per second (FLOPS), according to ETA.

It will also have 500M bytes of common memory and 25M bytes of storage. The HSP-2 is capable of one billion FLOPS, ETA claimed.

Meanwhile, ETA will also be shipping an ETA 10 Model P entry-level supercomputer to the Total Compagnie Francaise des Petroles, a major French petroleum company. The $2 million contract calls for an ETA 10 Model P to be shipped in July. ETA claimed its low-end machine can perform 375 million FLOPS.

If...

VSAM performance and integrity is an issue.

Then...

Goal Systems International
DCM-VSAM

The best supported VSAM product line in the industry.

/* FAVER—VSAM file management system with comprehensive reorganization and backup/restore capability. Available for MVS and VSE.
VSAMAID—Tune VSAM automatically while eliminating inefficiences—a cluster modelling, performance and capacity planning tool. Available for MVS and VSE.
MASTERCAT—An online and batch VSAM catalog information product for MVS and VSE.
COMPRESSOR/MVS—Provides compression of VSAM datasets that can triple disk capacity. */

To Find Quality Call 800-848-4640.

Goal Systems

Goal Systems International • 7965 N. High Street • Columbus, Ohio 43235 • 800-848-4640
Goal Systems International S.A.R.L. • 88 avenue de Wagram • 75017 Paris, France • Phone: (1)42 67 55 55 • Telex: 641.094

Okidata

FROM PAGE 67

Okidata's vice-president of marketing. "That equates to 1,000 letters per week over 2½ years," he said.

The two 24-pin printers operate at 270 char./sec. for utility printing and 90 char./sec. for letter quality. Marketed as the Microline 390 and 391 — the latter is a wide-carriage version — the printers cost $699 and $949, respectively.

The printers come with IBM X/24 and Epson America, Inc. LQ compatibility and two resident fonts: Courier Letter Quality and Gothic. Additional font cards are also available and cost $49. The printer comes standard with a parallel interface, although an optional, user-installable serial interface attachment will be made available in August, Golderer said.

Offered with a standard push tractor, the printers can be configured with a pull-tractor mechanism to facilitate the use of continuous forms, a cut-sheet feeder with 170-sheet capacity and an acoustic cover. Users can automatically switch from continuous-form to cut-sheet printing by parking the tractor mechanism and snapping the single-sheet feeder into place.

The two nine-pin printers operate at 300 char./sec. in high-speed draft mode at all pitches, 250 char./sec. for utility printing and 63 char./sec. for near-letter-quality output. The Microline 320 costs $499, and the wide-carriage version — the 321 — is priced at $699.

The printers contain the same optional paper handling capabilities as the 390 models but are not equipped to handle font cards, Golderer said. The 320s have co-resident Epson 86 and IBM Proprinter emulation, and two resident near-letter-quality fonts — Courier and Sans Serif — come standard, the company said.

CHECK THE BOX THAT BEST DESCRIBES YOU.

I get interrupted by users who need help

- ☐ 5 times a day
- ☐ 10 times a day
- ☐ 15 times a day
- ☐ I stopped counting

ANNOUNCING ADROIT PLUS. IT MAKES EVERY APPLICATION SELF-SUPPORTING.

With today's tighter budgets, you can't always hire all the support people you need. And even if you could, there aren't enough qualified people out there.

Which means MIS people who should be doing other things are being interrupted to help users. Usually with the same problems. Over and over and over.

The answer: Get the computer to do it. With ADROIT PLUS.

ADROIT® makes the expertise of your support people available on a PC. It lets you create context sensitive help screens and diagnostic information that appear along with your live application. Without changing a line of mainframe code. Or using any mainframe resources. Because ADROIT runs on a PC in cooperation with your application on an IBM mainframe.

You can also simplify computer commands for users by automating repetitive functions with ADROIT.

In addition, ADROIT easily captures application screens along with field definitions for quick development of realistic software simulations.

And you don't have to be a CBT developer to use ADROIT.

ADROIT. It lets you get more from the people and computer you have.

For a free ADROIT demonstration disk call 1-800-ADR-WARE. Or send us the coupon.

ADR PERFORMANCE SOFTWARE.
Unlock the potential.

CW 4/25/88

Applied Data Research, Inc., ADROIT Division.
Orchard Road & Rt 206, CN-8, Princeton, NJ 08540
1-800-ADR-WARE. In NJ, 1-201-874-9000.

☐ Please send me more information and a free ADROIT demonstration disk.
☐ Please have an ADR representative call.

Name_____ Position_____

Company_____ Phone_____

Address_____

City_____ State_____ Zip_____

I get interrupted by users who need help
☐ 5 times a day ☐ 10 times a day ☐ 15 times a day
☐ I stopped counting

ADR
AN AMERITECH COMPANY

© 1988 ADR

Storage Tech offers 18-track tape system

LOUISVILLE, Colo. — Storage Technology Corp. recently announced an 18-track cartridge tape subsystem that boasts a lower initial cost than its 9-track system.

The Model 4980 allows minicomputers to interchange data tapes with IBM 3480 and compatible mainframes at a transfer rate of 3.3M byte/sec. using a small computer systems interface (SCSI), according to a company spokesman.

Storage Technology offers its own interface, which allows a transfer rate of 1.5M byte/sec.

terface, which has a dual host attachment. That interface allows a transfer rate of 1.5M byte/sec. The firm's 9-track system offers a peak 1.25M byte/sec. transfer rate with SCSI.

The basics

The basic configuration with one control unit and one transport in quantity to the OEM market is $33,750.

The 9-track system costs $35,700. The controller is powered by dual microprocessors and has a 1M-byte cache buffer that allows multiple tape drives to be used simultaneously, according to the company. The unit is said to be field upgradable with the addition of an extra transport or a slave cabinet that has two transports.

Storage Technology said the system will be generally available in the third quarter of this year.

Storage Technology also announced that it has adapted its 5000 Series Printer Subsystem to attach directly to DEC VAX systems.

The Storage Technology 5000 series of printers includes model 021 at 2,100 lines per minute (lpm); model 028 at 2,800 lpm; and model 050 at 3,000, 3,800 and 5,000 lpm.

Storage Technology said the models are upgradable from lower-speed to higher-speed models.

"DEC users have been encouraging us to enter their market with a relaible, heavy duty printer, " said Richard R. Douglas, corporate senior vice-president in a prepared statement.

The 5,000 Series printer subsystem is list priced from $35,000 to $74,000. General availability will be this month.

Savage

CONTINUED FROM PAGE 67

that people won't like it," Evans said.

Evans added that the machine is being debugged without actually existing. This debugging is done on the company's own simulators — products for which Evans and Sutherland is better known.

I detect a loyalty to scientific truth rather than gee-whiz marketing in Evans' statements. A former computer science and electrical engineering professor and a computer professional for 38 years, Evans appears to be a true techie. Those with purely technical backgrounds often see reality in truer hues than the rose-tinted shades perceived by marketing types.

And fair is fair. If the Evans and Sutherland graphics supercomputer is not available late this year, I will report it, but I promise I won't call it vaporware.

Savage is a *Computerworld* West Coast correspondent.

HP interface

CONTINUED FROM PAGE 67

SCSI features, including support for up to eight devices on the bus, parity and bus arbitration.

Support software, designed for use only with magnetic disks, implements the ANSI-standard common command set for direct-access devices.

The three SCSI-compatible disk drives, which are manufactured by HP itself, include the HP 7957S, offering 107M bytes of storage; the 7958S, capable of storing 161M bytes; and the 7959S, which stores 323M bytes.

The disk drives all use a 5¼-in. Winchester disk, which offers a seek time equal to 17 msec and a burst transfer rate of 1.5M byte/sec., the vendor said.

The HP 7957S is priced at $5,675, the 7958S costs $7,300, and the 7959S is priced at $9,350. The drives are available eight weeks after receipt of order.

Customers can use third-party SCSI devices, integrating them with an HP system using HP's software tools, which were announced with the drives and interfaces.

SCSI cards are priced at $795 for the Model 319, $1,100 for the Model 330 and $1,100 for the Model 350. The cards are available four weeks after receipt of order.

The HP spokesman said the firm may offer SCSI-compatible products on its Spectrum series later.

IBM without CCA.

If you want high performance from your IBM® mainframe, you can't get it from IBM alone. The only route to true high performance is Model 204 DBMS software from Computer Corporation of America.

From the 3090 to the 9370 and across all operating systems, Model 204 will make your application run faster now. CCA software combines power and flexibility to handle large databases and complex applications. And it helps you handle the biggest business challenge of all - the future.

We've been dedicated to one thing for over 20 years: building high-performance software. We never stop working to make our products run faster and better. Today, they outperform everything else.

Remember, no matter what your mainframe looks like: without CCA, high performance is just an empty promise.

IBM is a registered trademark of IBM Corporation

Stormy rates

CONTINUED FROM PAGE 67

ing on exchange-rate arbitrage to hold its profits. In contrast, NAS has shunned this approach, relying on agreements with Hitachi to smooth out exchange-rate turbulence. Although both measures are intended to avoid cost increases, the strategies themselves are expenses that promise to escalate.

Amdahl has been hedging its dollars since late 1985, according to Ed Thompson, the company's chief financial officer. And hedging in the currency market costs money. The company reported that it spent $2 million on hedging in 1986 and more than $5 million in 1987. John Luhtala, Amdahl's international treasury manager, handles the firm's hedging; he reported that the strategy will cost more this year.

Amdahl hedges primarily by playing the options market. "If we didn't play this game, the cost of goods would skyrocket. It puts enormous pressure on our margins," Luhtala said.

Another way Amdahl tries to keep down the cost of its source hardware is by locking in exchange rates at the beginning of the year, or "future buying." This is simply a contract with Fujitsu that specifies a price for hardware delivered at a certain time.

This is not as advantageous as currency hedging, according to Luhtala. "This is locked into a delivery plan. With options, you can walk away from it," he explained. Fujitsu is taking the risk that the dollar will still be worth something at the time of delivery, but Amdahl must take the goods whether the inventory needs them or not, Luhtala added.

NAS is not currently an active player in the options market, although it is now evaluating whether it should take part. So far, it appears that Hitachi has been taking most of the risks for its partner.

NAS has relied on the future buying technique. In an effort to spread risk, there are yen-dollar price triggers in the two companies' contracts. When a given exchange rate is reached, vendor and supplier must head to the the negotiating table to hammer out a new agreement, according to Atam Lalchandani, NAS's chief financial officer. "The trigger has been activated in the last 18 months," he acknowledged.

Amdahl also has triggers in its contracts, but the contingencies are mapped out so that the firm does not have to go back to the bargaining table with Fujitsu, according to Luhtala. There is a "Plan A" and a "Plan B," depending on the situation, he said. "That means we don't have to spend endless amounts of time in negotiations."

Even though the dollar has continued to fall, Lalchandani said that six months ago, it was still not economical for NAS to hedge in the options market. "The cost of hedging six months into the future is about 1.5% of the dollar volume at today's prices. If, say, you were hedging $40 million worth, that'a a significant cost."

Lalchandani said he cannot tell just how much Hitachi is suffering from the currency situation. "I'm not sure that its incremental profit is negative. I hope that's not true." Another NAS source said the currency dilemma has "put a stiffness in negotiations."

International safety valve

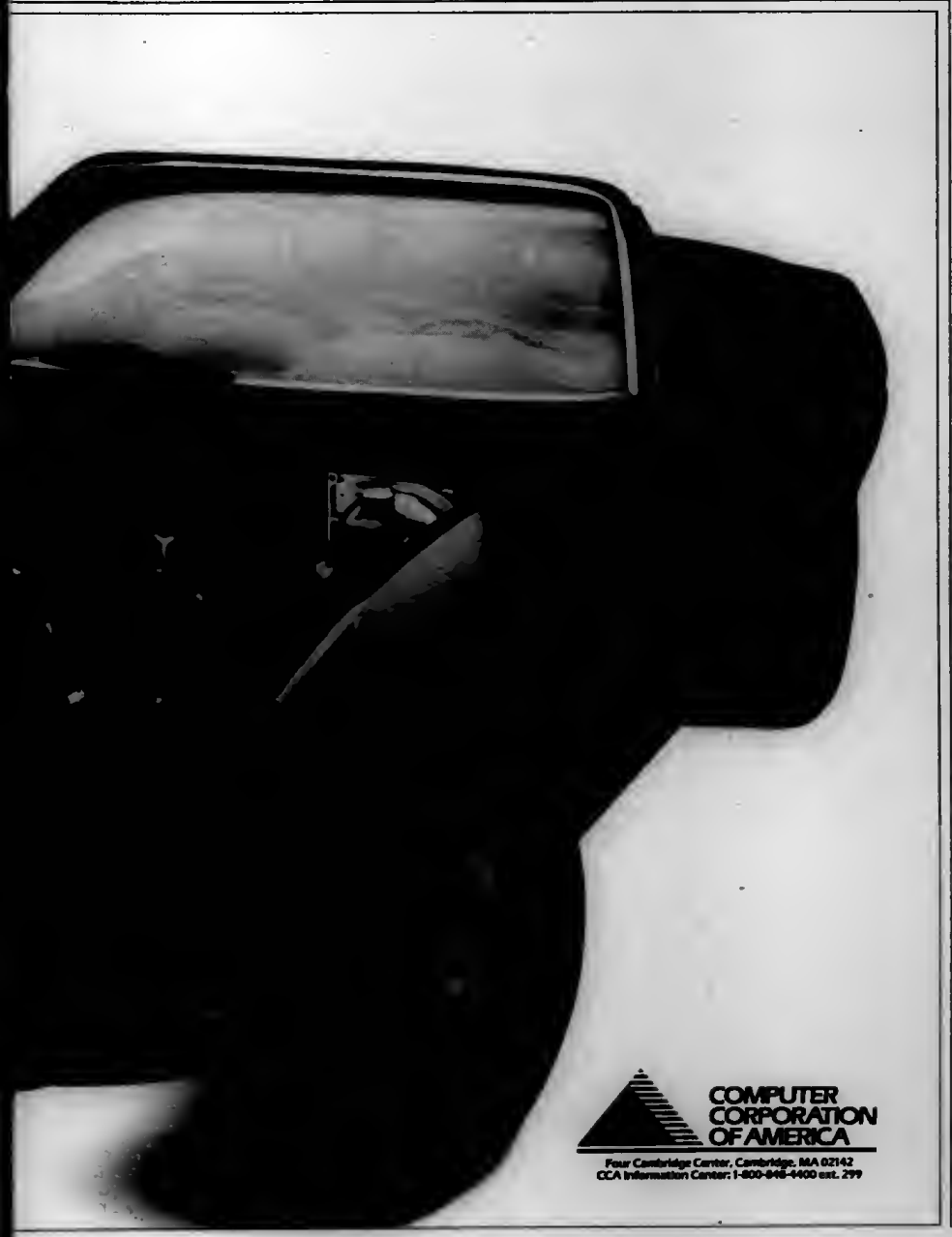
One safety valve for both vendors has been international sales. The relatively weak dollar against European currencies has helped boost sales in Europe.

"The exchange rate will probably hurt them domestically, but it may help them elsewhere. It may be a wash," offered Jeffry Beeler, an industry analyst at Dataquest, Inc. in San Jose, Calif.

Luhtala said that because IBM obtains some key hardware components from Europe, the European-American exchange rate works to its disadvantage, helping to level the playing field for the PCMs. Buying in European currencies is just about as bad as buying Japanese, Luhtala noted.

Despite the exchange rate acrobatics the vendors must perform, both NAS and Amdahl firmly maintained that they need not raise prices. The vendors said their pricing structures are independent of the cost. "The pricing is not based on subassemblies, but on the market," a NAS spokesman said.

"We don't necessarily pass on [manufacturing] costs to customers," Lalchandani said. "It is part of management's job to keep up with the changing external market. We have to come up with strategies to keep making money — we never want to give anything away."



Pick-based minis hit the market

McDonnell Douglas Computer Systems Co. recently announced two minicomputers, the Series 18 Model 300 and Model 600, based on Reality, the company's version of Pick Systems' Pick operating system. Reality is a dictionary-driven relational data base, which the firm claimed allows users to determine access and retrieval of data.

The company said its proprietary Reality CPU has a cycle time of 160 nsec; the Models 300 and 600 have clock speeds of 10 MHz and 25 MHz, respectively.

The Series 18 Model 300 supports from eight to 96 users at an entry-level price of $39,000. An entry-level Series 18 Model 600 system, priced at $199,000, supports 32 users.

NEW PRODUCTS

Processors

A compatible memory card for Prime Computer, Inc.'s 6350 and 6550 processors has been announced by **EMC Corp.**

Called **E6000-8MB**, the card is also compatible with Prime's 4050 and 4150 office environment computers. It uses 256K bytes of random-access memory chip technology and provides 8M bytes of main memory.

The E6000-8MB costs $16,800; a 32M-byte version costs $38,500.

EMC also announced a price reduction on all its **Falcon series** disk subsystems for Hewlett-Packard Co. minicomputers. Prices now range from $9,900 for the Falcon 400H 406M-byte subsystem to $28,650 for the Falcon 1200, a 1.25G-byte subsystem with 4M bytes of cache memory.

EMC, Hopkinton, Mass. 01748. 617-435-2541.

Graphics systems

Ramtek Corp. has announced **true-color imaging** for its Ramtek 4660 Imagine Display System.

The 4660 option displays a 1,280- by 1,024-pixel by 24-bit image and eight additional bits of graphics overlay. Each of the image look-up tables is configured to process eight bits of refresh memory, providing 256 shades per primary color of red, green and blue.

A fourth graphics overlay table provides up to 64 simultaneous overlay colors, image look-up table partitioning and output selection and a 10% overlay brightness selection.

Other features include 4.5M bytes of display list memory, a direct memory access interface and the ability to combine graphics and imaging in a single controller.

The true-color imaging option costs $4,500.

Ramtek, 2211 Lawson Lane, Santa Clara, Calif. 95054. 408-988-2211.

Terminals

A terminal said to emulate Digital Equipment Corp.'s VT320 has been announced by **Relisys.**

The **Model RA320** features a 14-in. nonglare screen in amber, green or paper-white phosphor. The format includes 24 data lines in either 80 or 132 columns plus a 25th status line. Other screen attributes include reverse video, underline, bold, blink, blank and double-height, double-width characters, split screen, screen saver and menu set-up screen.

The unit comes with a DEC-compatible keyboard with 15 programmable function keys. Communications over DEC 423 and RS-232C serial communications and printer ports are at 75 to 19.2K bit/sec.

The Model RA320 costs $545. It will be available in May, the vendor said.

Relisys, 320 S. Milpitas Blvd., Milpitas, Calif. 95035. 408-945-1062.

Printers/Plotters

Bruning, a division of AM International, has cut the price of its dual-mode **Zeta 824CS** and **Zeta 836CS** plotters.

The 836CS plotter produces A- to E-size plots, and the 824CS produces A- to D-size plots. Features include a continuous-roll capability of up to 120 ft as well as single-sheet capabilities.

The plotters support Bruning's Graphic Machine Language, Hewlett-Packard Co.'s HPGL, Calcomp's 960 and Tektronix, Inc.'s Plot 10 graphics languages. They offer IEEE, RS-232C and IBM coaxial interfaces.

The plotters offer speeds to 25 in./sec. Functions include scaling, windowing and rotating.

The 824CS costs $5,950, and the 836CS costs $9,900.

Bruning, 777 Arnold Drive, Martinez, Calif. 94553. 415-372-3427.

The triple-bin **Laserfeeder**, a product for Wang Laboratories, Inc.'s LPS-8 laser printer on Wang OIS and VS systems, has been announced by **BDT Products, Inc.**

Laserfeeder is said to automatically feed paper and envelopes into the Wang LPS-8. Users can select two different types of paper or feed envelopes using standard Wang software, the vendor said. Laserfeeder expands the capacity to 540 sheets of paper and 60 envelopes.

Laserfeeder fits directly behind the Wang printer. It costs $1,795.

BDT Products, 17152 Armstrong Ave., Irvine, Calif. 92714. 714-660-1386.

Power supplies

A power protection device for IBM System/34 and 36 computers has been announced by **HDR Power Systems.**

Called **Line/UPS**, the system consists of a line power conditioner module with dual output voltages to protect against spikes, dips, noise and transients.

It includes an integral transfer switch that automatically connects the computer to the commercial power source should the conditioner fail or become overloaded.

Line/UPS modules cost approximately $3,000.

HDR Power Systems, 600 Oakland Park Ave., Columbus, Ohio 43214. 614-262-6832.

Why our system programming classes are full of people who use our competitors' CPUs.

It's true. More than two-thirds of our students work in organizations that use our competitors' machines. They come to us for five reasons:

- Our instructors are veteran system programmers who've practiced what they preach.
- They're also professionally trained instructors who know how to preach what they've practiced.
- Our classes are small, so it's easy to have the sort of give and take that makes learning fun.
- Many are taught in labs with on-line systems, so students can practice what their instructors preach, hands-on.
- They know you have to study with the best when you aim to be a grand master.

Choose from 50+ courses.

This year's Amdahl Education and Professional Services curriculum covers:

- MVS
- MVS/XA
- SMP/E
- VSAM
- JCL
- VM/CMS
- CP
- VM/HPO
- VM
- IMS/VS
- ACF/NCP
- ACF/VTAM
- SNA
- JES2
- ASSEMBLER

And you can take these courses in these cities:

- Atlanta
- Chicago
- Houston
- New York
- Columbia (MD)
- Los Angeles
- Orange (CA)
- Santa Clara (CA)

For a catalog that details our curriculum, call:
Call 1-800-233-9521, ext. 68 or
1-800-233-5727, ext. 68 in CA

amdahl
The SMART Choice

COMPUTERWORLD

SPOTLIGHT

CORPORATE ELECTRONIC PUBLISHING

integration is now the magic word in electronic publishing. Technologies are starting to merge as new types of input and output devices expand the possibilities of document production.

We Make It Better.

The Standards.

The Wyse WY-700 Graphics Subsystem. In desktop publishing, PC users have set high standards for themselves. Among displays, their first choice is our WY-700 high resolution monitor and video board. It's the best seller by a wide margin, for reasons that are plain to see. The WY-700's sharp 1280 x 800 pixel resolution rivals subsystems costing twice its $999 price. No one else gives you nearly as many pixels per dollar. And its 15" paper white screen presents two full, truly WYSIWYG pages in high resolution mode.

It should come as no surprise that the leader in displays is also the leader in software compatibility. As the standard, the WY-700 graphics subsystem now runs over 100 programs in high resolution mode. Including Xerox Ventura Publisher and Aldus PageMaker/PC, plus many other DTP applications. And if you do more than desktop publishing, the WY-700 supports packages like Microsoft Windows and Excel, Lotus 1-2-3, and AutoCAD.

We've just bundled a Hotshot product. Now the WY-700 comes bundled with Hotshot Grab, from Symsoft. It enables you to capture and store any text or graphics screen and transport it to another file or DTP application. For example, with a few keystrokes you can load a CAD image into your DTP document. And Hotshot Grab, a $99 value, is free with the WY-700. Now. But not forever.

Graphic images captured by Hotshot Grab.

SystemWyse™ adds even more. Wyse is the only manufacturer who makes the monitor and video board in its DTP graphics subsystem as well as a selection of 286 and 386 based PCs to drive it. That gives you a system integrated with singular harmony. And supported by a singular source.

Find out why more PC users see desktop publishing our way. Call for more information.

1-800-GET-WYSE

WYSE

We make it better, or we just don't make it.

Wyse® is a registered trademark of Wyse Technology. SystemWyse and WY 700 are trademarks of Wyse Technology. Other trademarks/owners: Ventura Publisher/Xerox, Aldus PageMaker/PC: Aldus, Hotshot Grab/Symsoft: Excel: Windows/Microsoft: Lotus 1 2 3/Lotus Development, AutoCAD/Autodesk. Screen text and graphics adapted from *The Classical Orders of Architecture*, by Robert Chitham. Rizzoli International, NY

Reading someone else's copy of Computerworld?

Get your own — You deserve it!

YES! I want my own subscription to COMPUTERWORLD. I'll pay just $44 for 51 weekly issues — that's only 86¢ per copy. In addition, I'll receive 12 FREE issues of COMPUTERWORLD FOCUS.

FIRST NAME M.I. LAST NAME

TITLE

COMPANY

ADDRESS

CITY STATE ZIP

Address shown: ☐ Home ☐ Business

For faster service call 1-800-255-6286! In NJ call 1-800-322-6286.

Canada, Central America & South America $110/Europe $165 All other countries $245 (Airmail)
Foreign orders must be prepaid in U.S. dollars.

Please complete the information to the right to qualify for this special rate.

COMPUTERWORLD

1 BUSINESS INDUSTRY (Circle one)
10. Manufacturer (other than computer)
20. Finance/Insurance/Real Estate
30. Medicine/Law/Education
40. Wholesale/Retail/Trade
50. Business Service (except DP)
60. Government — State/Federal/Local
70. Communications Systems/Public Utilities/Transportation
75. Mining/Construction/Petroleum/Refining/Agric
80. Manufacturer of Computers, Computer-Related Systems or Peripherals
90. Computer & DP Services including Software/Service Bureau/Time Sharing/Consulting
25. Computer/Peripheral Dealer/Distributor/Retailer
75. User Other _____
99. Vendor Other _____
(Please specify)

2 TITLE FUNCTION (Circle one)
IS/MIS/DP MANAGEMENT
10. Vice President Asst. VP
21. Dir. Mgr. Supv. IS/MIS/DP Services
03. Dir. Mgt. Supv. of Operations, Planning, Adm. Services
23. Dir. Mgr. Supv. Analyst of Systems
31. Dir. Mgr. Supv. of Programming
03. Programmer Methods Analyst
09. Dir. Mgr. Supv. OA/WP
38. Data Comm. Network/Systems Mgt.
OTHER COMPANY MANAGEMENT
11. President Owner/Partner General Mgr.
12. Vice President/Asst. VP
13. Treasurer Controller Financial Officer
41. Engineering Scientific R&D Tech Mgt.
51. Sales/Mktg. Mgt.
OTHER PROFESSIONALS
00. Consulting Mgr.
70. Medical Legal Accounting Mgr.
99. Educators Journalists Librarians Students
00. Others _____
(Please specify)

3 COMPUTER INVOLVEMENT (Circle all that apply) Types of equipment with which you are personally involved either as a user, vendor or consultant
A. Mainframes/Supermins
B. Minicomputers/Small Business Computers
C. Microcomputers/Desktops
D. Communications Systems
E. Office Automation Systems
F. No Computer Involvement

348817-8

Reading someone else's copy of Computerworld?

Get your own — You deserve it!

YES! I want my own subscription to COMPUTERWORLD. I'll pay just $44 for 51 weekly issues — that's only 86¢ per copy. In addition, I'll receive 12 FREE issues of COMPUTERWORLD FOCUS.

FIRST NAME M.I. LAST NAME

TITLE

COMPANY

ADDRESS

CITY STATE ZIP

Address shown: ☐ Home ☐ Business

For faster service call 1-800-255-6286! In NJ call 1-800-322-6286.

Canada, Central America & South America $110/Europe $165 All other countries $245 (Airmail)
Foreign orders must be prepaid in U.S. dollars.

Please complete the information to the right to qualify for this special rate.

COMPUTERWORLD

1 BUSINESS INDUSTRY (Circle one)
10. Manufacturer (other than computer)
20. Finance/Insurance/Real Estate
30. Medicine/Law/Education
40. Wholesale/Retail/Trade
50. Business Service (except DP)
60. Government — State/Federal/Local
70. Communications Systems/Public Utilities/Transportation
75. Mining/Construction/Petroleum/Refining/Agric
80. Manufacturer of Computers, Computer-Related Systems or Peripherals
90. Computer & DP Services including Software/Service Bureau/Time Sharing/Consulting
25. Computer/Peripheral Dealer/Distributor/Retailer
75. User Other _____
99. Vendor Other _____
(Please specify)

2 TITLE FUNCTION (Circle one)
IS/MIS/DP MANAGEMENT
10. Vice President Asst. VP
21. Dir. Mgr. Supv. IS/MIS/DP Services
03. Dir. Mgt. Supv. of Operations, Planning, Adm. Services
23. Dir. Mgr. Supv. Analyst of Systems
31. Dir. Mgr. Supv. of Programming
03. Programmer Methods Analyst
09. Dir. Mgt. Supv. OA/WP
38. Data Comm. Network/Systems Mgt.
OTHER COMPANY MANAGEMENT
11. President Owner/Partner General Mgt.
12. Vice President/Asst. VP
13. Treasurer Controller Financial Officer
41. Engineering Scientific R&D Tech Mgt.
51. Sales/Mktg. Mgt.
OTHER PROFESSIONALS
00. Consulting Mgr.
70. Medical Legal Accounting Mgr.
99. Educators Journalists Librarians Students
00. Others _____
(Please specify)

3 COMPUTER INVOLVEMENT (Circle all that apply) Types of equipment with which you are personally involved either as a user, vendor or consultant
A. Mainframes/Supermins
B. Minicomputers/Small Business Computers
C. Microcomputers/Desktops
D. Communications Systems
E. Office Automation Systems
F. No Computer Involvement

348817-8

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS PERMIT NO 55 NEPTUNE, NJ 07754

POSTAGE WILL BE PAID BY ADDRESSEE

COMPUTERWORLD
CIRCULATION DEPARTMENT
P.O. Box 1565
Neptune, NJ 07754-9916

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS PERMIT NO 55 NEPTUNE, NJ 07754

POSTAGE WILL BE PAID BY ADDRESSEE

COMPUTERWORLD
CIRCULATION DEPARTMENT
P.O. Box 1565
Neptune, NJ 07754-9916

INSIDE

Product Face-Offs
Varityper's VT 600 and Printware's Printware 720 IQ Laserimager make inroads on high-quality printing. Page S3.

Aldus's Pagemaker and Interleaf's Interleaf Publisher for the Macintosh illustrate how desktop and corporate publishing are meeting at the personal computer workstation. Page S4.

Ask the Vendor
Vendors respond to questions about displaying Compugraphic fonts onscreen, Ventura Publisher's width tables and support for Interleaf's TPS. Page S4.

More Than a Peripheral...
Scanners are helping to move corporate electronic publishing in the direction of increased integration. Page S5.

Vendor Viewpoint
Using an existing IBM mainframe for electronic publishing can lower costs and improve the freshness of document content. Page S11.

Product Charts
A selected listing of turnkey electronic publishing systems. Page S8.

A detailed guide to page composition software. Page S9.

SENIOR EDITOR
Joanne Kelleher
ASSOCIATE EDITOR
Deborah Fickling
DESIGN EDITOR
Marjorie Magowan
RESEARCHERS
Sally Cusack
Bonnie MacKeil

Cover illustration:
Warren Gebert

Copyright 1988 by CW Publishing/Inc. All rights reserved. Reproduction of material appearing in Computerworld Spotlight is forbidden without written permission. Send all requests to Nancy Shannon, CW Publishing/Inc., Box 9171, 375 Cochituate Road, Framingham, MA 01701-9171.

Publishing is starting to become a strategic undertaking as companies contemplate pooling document resources

PIECING TOGETHER THE BIG PICTURE

BY SCOT FINNIE

P. CHARLES LADOUCEUR

There are levels of meaning in the phrase "electronic publishing" that corporations are just beginning to uncover. To Debbie Sharp, production manager at Associates Corporation of North America, electronic publishing stands for producing better-looking training manuals with less labor. Before the Dallas-based Gulf & Western, Inc. financial unit acquired its NBI, Inc. 5000 series multistation electronic publishing system in April 1987, preparing the manuals, which are distributed to its customer and field personnel, "was a lot of work, and they looked terrible," Sharp says.

The process, she recalls, involved preparing text on a Wang Laboratories, Inc. PC, with graphics developed separately on an Apple Computer, Inc. Macintosh. The result was documents that consisted of both daisywheel and laser printer output.

The NBI system has saved the company about $25,000 in time and labor costs so far, according to an analysis done five months after the system was installed.

Electronic publishing, as defined at Associates, is a giant step forward from a few years ago, when organizations either sent their document preparation work out of house or struggled through the pitfalls of inadequate homegrown and desktop methods.

But it is only primer material compared with what others are either attempting or beginning to envision.

In New York, NBC maintains a Kodak Ektaprint Electronic Publishing System network of workstations from Eastman Kodak Co. and a Sun Microsystems, Inc. node running Interleaf, Inc. software hard-wired into NBC's companywide Wang word processing system.

The result is a centralized, integrated electronic publishing system that can print documents on in-house laser printers or a phototypesetter, either as finished products or as art for a copier duplicator or an offset printer.

Applications for the system include business presentation documents and charts, training and operating manuals and personnel materials.

Federal Express Corp. in Memphis takes yet another shape. Until recently, it maintained a Wang VS 100-based publishing system. The 75-terminal Wang system produced about 500 operations and procedure manuals that support airplane maintenance, ground crews, electronics systems, telecommunications operations and domestic and international shipping laws and policies.

The company is currently making the transition to its second generation of electronic publishing. All publishing files based on the Wang system are being moved to a recently installed Digital Equipment Corp. Microvax II.

In addition, the company is evaluating software to link its large installed base of Macintoshes to its DEC system and to bring page makeup and what-you-see-is-what-you-get capabilities to the Macintoshes. The Wang mainframe composition package does not offer that capability.

According to David Artman, a corporate publishing strategies research analyst at the Gartner Group, Inc., a Stamford, Conn.-based market

Finnie is a free-lance writer based in Stamford, Conn.

Big picture

FROM PRECEDING PAGE

research firm, technical documentation and engineering applications in the aerospace area represented — at 30% — the largest market for electronic publishing sales in 1987.

That trend may change, however. John Cuonzo, an associate director of computer publishing systems at CAP International, Inc., a Marshfield, Mass., market research firm specializing in computer printing and publishing, says he expects electronic publishing's largest growth to come in office and administrative areas. A slowdown is expected in the technical documentation market cutbacks in Pentagon expenditures for defense-related projects. But even more importantly, organizations are discovering the cost and waste involved in their current methods of handling printing and publishing requirements.

Interconsult, Inc., a Cambridge, Mass., consulting firm specializing in corporate electronic publishing, projects that U.S. corporations spend from 6% to 10% of their gross revenue dollars on printing and publishing documents such as marketing brochures and personnel pamphlets. A substantial cost savings could be realized if these existing applications were partly or fully prepared by employees using in-house systems.

Federal Express, for example, approached the purchase of its first electronic publishing system several years ago with the expectation that costs for producing a full page of text or graphics would be reduced by 35%. "Instead," says John Slangerup, managing director of publishing services, "we cut them by 60% and paid for our equipment investment in less than two years."

Not always bottom line

Consultants and others who have been through the process stress that not every company will see this kind of bottom-line savings, because new printing applications often spring up when electronic publishing is brought in-house. "Almost invariably, latent applications show up with the availability of in-house publishing capabilities," says Ted Freiser, president of New York-based John Diebold & Associates.

That large well of latent applications is one of the things that makes industry observers so sure that this technology is about to become a corporate imperative. Figures vary on the current and potential size of the corporate electronic publishing market. Interconsult puts the current figure at $5.5 billion and projects that it will level off at about $7 billion annually in 1989 and 1990. CAP International shows the industry to be at about $1.5 billion in sales in 1987, growing to $4.1 billion in 1991.

What everyone does seem to agree on, however, is that corporate electronic publishing is on the verge of becoming a major industry and a significant force of change within organizations.

Publishing is the cutting edge of all the important things happening in computers right now, says Jonathan Seybold, president of Seybold Publications in Malibu, Calif., which publishes the "Seybold Report on Publishing Systems" and the "Seybold Report on Desktop Publishing."

"What will ensue is that people will begin to look at publishing as part of an overall computer and information strategy within their organizations," he says.

The best way

Before the full potential of corporate electronic publishing can be realized, however, there are other issues organizations must address, not the least of which is figuring out how to approach implementation.

At the core of the discussion is whether to implement a centralized publishing service for the entire company or to set up specialized units by department.

On one side, there is the low-cost, self-determination option offered by desktop publishing, which in the original sense of the term means single-user systems consisting of a personal computer, a laser printer and a stand-alone page-makeup program.

Many companies have defaulted to desktop approaches at a departmental or personal level, because individual employees thought it was the cheapest, fastest, easiest way for them to go, explains Frank Romano, electronic publishing consultant and publisher of *Typeworld* in Salem, N.H.

Meanwhile, Romano says, corporations are looking at the problem and wondering if it wouldn't be smarter to bring in large centralized systems operated by skilled people.

The problem with assigning too much work to decentralized desktop publishing systems, according to Michael Boeniak, NBC's manager of support services, is that, despite the impressions left by some of the marketing for these systems, design is not a universal skill. "You can train people to run the equipment, but that doesn't guarantee the product will be good," he says.

Another common corporate concern about desktop publishing is preserving the company identity in printed material. "With so many people in the company designing their own documents, you could lose control of your corporate image," says Cheryl Nanos, supervisor of printing services at Unum Life Insurance Co. in Portland, Maine.

After going public recently, the company established a strong corporate-identity program promoting an image Nanos describes as "very conservative." But, she says, when Unum employees use desktop publishing, they tend to integrate "funny little graphics. If the audience is internal, we can live with that. But we need to be careful that that is not what our clients see, because it is not our image."

Alternatives to desktop publishing are offered by vendors such as Context Corp., DEC, Interleaf, Kodak, NBI, Texet Corp., Wang, Xerox Corp. and Xyvision, Inc., which have products based on a range of platforms.

In every case, these vendors' solutions were designed to address the needs of a work-group environment, the level at which experts say most corporate publishing is undertaken. In some cases, these products are also specially structured or configured to address specific needs.

Striking a balance

Many companies end up with a combination of products to meet the varied needs of a broad spectrum of users. In the real world, a balance is struck between centralized and decentralized services. Unum is a case in point. While several of its employees use micro-based desktop publishing packages, the company also maintains a centralized Xyvision system.

But juggling that kind of variety requires more planning than organizations typically put into their investments.

According to David Boucher, president of Interleaf, very few corporations currently have a strategy in place for coordinating publishing throughout their businesses, but many are beginning to think they need to address the issue.

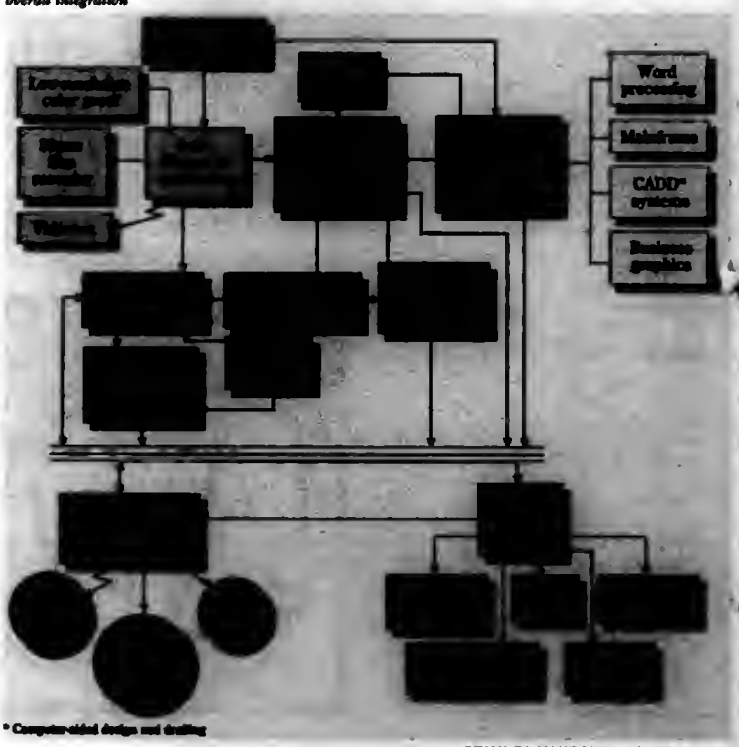
"It is a hot topic right now," Boucher says. "We are going to see pilot programs over the next 12 to 18 months that will be publicized as case studies."

Other vendors agree. Howard Woolf, DEC's manager of electronic publishing systems, contends that companies that develop an overall electronic publishing strategy will have a competitive edge over those that do not. Some corporations, he says, are looking at enterprisewide electronic publishing as a tool for generating revenue and increasing market share rather than as just a cost-saving application.

One hurdle enterprisewide electronic publishing strategists face is a political one. Departments sometimes look on the

The shape of tomorrow

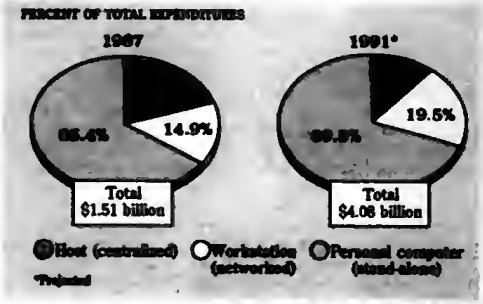
The corporate electronic publishing system of 1990 will feature expanded input and output options and overall integration



INFORMATION PROVIDED BY INTERCONSULT, INC.

Investment vehicles

How corporate investments in electronic publishing divide among system types



INFORMATION PROVIDED BY CAP INTERNATIONAL, INC.
CW CHART

ownership of a computer system as a symbol of corporate power — and struggle over it.

Straightening it out

Romano, for example, says that in his capacity as a consultant to companies looking to solve electronic publishing problems, he is often called on to act as a referee between such departmental groups as in-house printing, MIS and administrative services, each of whom tends to see electronic publishing as its own domain. It is important for any organization planning a major electronic publishing effort to resolve such territorial disputes now because there is an even more potentially volatile issue — document sharing — looming just over the horizon.

For the moment, the Holy Grail of electronic publishing is the companywide system. Because electronic publishing is generally the answer to the document processing needs of employees from one end of the organization to the other, it is also an application on which many are pegging their hopes for systems integration.

Instead of waiting for the integration solutions on the way from DEC, IBM and others, however, many companies are developing their own methods. The truth is, companywide electronic publishing does not seem to exist — yet. But plans are definitely on the drawing boards of some companies. The evolution of electronic publishing is being driven by the fact that while organizations are using it to save on printing costs, they have also developed electronic document data bases in the process.

In addition to being able to use these documents over and over again, users are also spreading that information around the company. Moreover, observers say, as MIS managers continue to find it difficult to manage the archiving, revisions and multiple copies of electronic documents, they will begin to want an even better solution.

Seybold, for one, says many businesses will begin to develop highly integrated electronic publishing systems that will give their employees general access to large electronic corporate document data bases.

'The real challenge'

That thought has already occurred to Wes Ervin, technology and development manager of the investment banking arm of First Boston Corp. in New York, where three separate multiple-workstation-based electronic publishing systems serve different parts of the company.

"The connectivity stuff is the beginning of wisdom, but the document management aspects are where the real challenge begins," he says.

With an enterprisewide electronic publishing system, the possibilities for improved efficiency seem boundless. For example, the marketing, sales, finance and technical writing departments could draw electronic data about a new product directly from engineering materials instead of having to start from scratch. They might even begin to do so while engineering is in the development stage.

At Unisys Corp., management is pursuing a corporate strategy for developing a common electronic data base of product information accessible for publication by any user group in the company. To accomplish this, William G. Wagner, Unisys's director of commercial product information, says the company is developing a set of generic codes that identify content elements. These codes will enable the establishment of document management standards, thereby permitting further implementation of a document data base to a wide variety of users.

> "THE CONNECTIVITY stuff is the beginning of wisdom, but the document management aspects are where the real challenge begins."
>
> WES ERVIN
> FIRST BOSTON CORP.

Unisys, which currently uses a Xyvision electronic publishing system consisting of nodes at 17 locations throughout the country, expects to settle on the codes and begin converting its documents by the end of the year.

Electronic delivery

The next step in electronic document management may be electronic distribution of documents. No one is predicting a truly paperless office, but the opportunity to transfer documentation to interested parties is surely not going to go untested once the systems are in place.

The U.S. Department of Defense has already issued an initiative calling for standards that could make the delivery of electronic documents from defense contractors to the department practical beginning in 1990.

The department's Computer-Aided Acquisition and Logistics Support initiative is likely to have far-reaching effects on electronic distribution and document format standards as they relate to electronic publishing: Vendors will support the DOD standards in order to remain marketable to defense and aerospace contractors. As a result, those standards will be in place for corporations as well.

Hand in hand with electronic document distribution is the concept of extended enterprise networking and publishing. Instead of one company maintaining its own system, this concept would allow systems within several companies or divisions to be tied together into one integrated publishing system. Defense contracting companies, which often work in partnerships with the DOD, may find the most use for this application. Wagner notes that the system Unisys is putting in place will enable it to work out extended enterprise systems with partners. At least one other major electronics manufacturer, which requested anonymity, is already circulating documentation on defense projects with several partners.

At this point, there is little likelihood that companies would purchase a companywide electronic publishing solution from just one systems vendor. Instead, it would probably be easier for companies to swap data internally, perform file conversions and maintain software compatibility. These integration issues crop up in virtually every electronic publishing system installation.

Interleaf seems to have taken the lead in the systems integration area because its software runs on many levels and brands of hardware. But that does not mean the rest of the field is not pursuing the issue. A rash of vendor alliances and joint agreements announced in recent months — including those between Apple and DEC, Texet and Wang and Sun Microsystems, Inc. and Xerox — could help further the causes.

Vendors are also working to develop and promote standards in several areas. Some examples are Adobe Systems, Inc.'s Display Postscript, DEC's Digital Document Interchange Format and the DOD-supported Standardised Generic Mark-up Language.

"If an electronic publishing system doesn't fit into the standards," says Arlene Karsh, a Stoneham, Mass., electronic publishing industry consultant, "don't even consider it."

Toward common ground

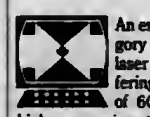
Related to the compatibility issue is the general industry trend away from proprietary publishing hardware toward more standard hardware platforms. Software based on these platforms is apt to be more portable than that locked into proprietary systems. In addition, standard-platform hardware usually retains its resale value longer than proprietary hardware because it can be put to several uses.

Xyvision, the last major holdout in proprietary electronic publishing hardware, says it is

Continued on page S12

PRODUCT FACE-OFF
Lasers get serious

BY JAY LUCAS



An emerging category of high-end laser printers, offering resolutions of 600 dot/in. or higher, promises to bridge the gap between phototypesetting and electronic publishing.

The objective of these powerful laser printers, best exemplified by East Hanover, N.J.-based Varityper's VT600 and the Printware 720 IQ Laserimager from Printware, Inc. in St. Paul, Minn., is to economically extend in-house electronic publishing systems into regions heretofore dominated by professional phototypesetting services.

An investment of roughly $15,000 in one of these printers will buy magazine-quality in-house execution of difficult printing tasks such as detailed drawings and fine print. Printers capable of 300 dot/in. resolution can make a mess of such projects because of their tendency to produce jagged diagonal lines and blurry fine-line drawings.

For organizations that need output of this quality, the benefits of producing it on-site are significant. Time is saved preparing print-ready masters and proofs, and these masters can be changed in minutes.

Leading lights

The Varityper VT600 is a beefy tabletop machine that weighs in at 161 pounds and occupies about as much space as a photocopier. It is also a prodigious power consumer — its two power cords draw 1,100W — and is best used with a dedicated line. It consists of a clean, straight-through paper-feed laser printer and a raster image processor designed to fit smoothly on the printer's top.

The raster image processor is quite powerful. It includes 6M bytes of random-access memory, a Motorola, Inc. 68020 microprocessor controller and a standard 20M-byte hard drive for font and cache storage built right into the box.

Although the processor must handle four times as many pixels as the standard 300 by 300 dot/in. printers, it can do so in much less time — a quarter of the time required by an Apple Computer, Inc. Laserwriter in one test.

The Varityper VT600 is capable of a crisp 600 by 600 dot/in. resolution, able to both distinguish fine hairlines and lay down blocks of ebony black.

At a typical cost of $13,500, plus about $200 per font family, the VT600 is clearly a serious purchase. It has an Apple Appletalk port that allows it to be connected to an Apple Macintosh Plus computer, using full Postscript capabilities. However, it also contains an RS-232 serial connection and a Centronics Corp. parallel port, making it very versatile.

The Printware 720 IQ Laserimager with 1200HD Image Processor takes a different approach but has roughly the same market in mind.

The 720 IQ sells for $12,980 and up, depending on the options for Adobe Systems, Inc.'s Postscript and the number of font families installed beyond the standard three. It was designed around a new resonant galvanometric approach to deflecting the printing laser beam.

This approach requires fewer moving parts and allows a resolution of 1,200 dot/in. horizontally, 600 vertically. The improvement over even 600 dot/in. is clearly visible under a magnification glass, where dots on the Printware machine can be seen to be about half the diameter of those on the Varityper, promising superior resolution in critical applications.

The Printware Image Processor is a separate box, enabling it to be placed at a distance from the printer if space is short.

Quick to clone

Printware is notable for its development of one of the first Postscript clones, its proprietary Printscript. It is said to be fully compliant with Adobe's Postscript language, and it can properly print standard Postscript pages from Xerox Corp.'s Ventura Publisher without a hitch. Currently, only an RS-232 and Centronics Parallel interface are available, but Appletalk and small computer systems interfaces are promised to be available by this summer.

Both printers deliver superior print quality, although the Printware machine has an edge over the Varityper with its higher resolution and duty cycle. The question is whether you care to make the extra investment in both purchase price and the undeniably higher upkeep costs that these advanced machines require.

Although there are compelling arguments for each of these machines, it is impossible not to think about the five to seven conventional laser printers that could be obtained for the same amount of money as one of these marvels. •

Lucas is a management automation specialist at the U.S. Patent & Trademark Office in Washington, D.C.

ASK THE VENDOR

The following questions were solicited from users and conveyed to the vendors for responses.

Will it be possible on The 'Puter Group's TC: Ventura to display the correct Compugraphic Corp. fonts either on-screen or on an Adobe Systems, Inc. Postscript laser printer, including the correct widths?

Maynard Kabak
Rosern Publications
Arlington Heights, Ill.

THE 'PUTER GROUP: We regret that there is no easy way to match the large Compugraphic font library to the smaller Postscript library for Postscript printer proofs. A Xerox Corp. spokesman says the company plans to allow for an external file to the Postscript driver in Ventura Publisher to permit products such as TC: Ventura to treat Postscript as a draft device. However, no dates for this update were mentioned.

In Xerox's Ventura Publisher, what are width tables, and how are they used?

Herbert Morrison
Aero Products Division
Litton Systems, Inc.
Moorpark, Calif.

XEROX CORP.: Ventura Publisher has calculated how each output device that it supports prints characters and spaces. These calculations are put into reference tables called width tables, which are used to generate the screen and print images for each character and space.

What hardware and software support for its TPS customers will Interleaf provide in the future?

Bob Medinger
Switching Systems Division
Rockwell International
Downers Grove, Ill.

INTERLEAF, INC.: A number of users are turning to us for help in integrating hardware from a variety of vendors and software running a variety of applications. As publishing increasingly becomes the central, integrating application in large, demanding environments, we expect to assist in establishing and maintaining such networks.

We're also making it easier for users to automate routine systems support tasks. The next TPS release contains a macro language that enables users to create scripts that can access the operating system as well as Interleaf documents.

Does Talaris plan to include Metafont in standard Texsupport distribution?

Brian Tillman
Smiths Industries
SLI Avionic Systems Corp.
Grand Rapids, Mich.

TALARIS SYSTEMS, INC.: Talaris does not currently plan to include Metafont, a public domain program, in its standard Texsupport distribution. However, it does plan to provide a tools facility to convert standard Metafont PK format output to the PK format used by the Talaris 1590 Printstation. •

ATTENTION:

IBM DCF & Waterloo Script users

GML/PC™

Now there's a powerful alternative that delivers style consistency and ease of use without undecipherable mega-macros.

GML/PC™ combines the simplicity of generic markup with a powerful style sheet-driven system that rivals anything on the mainframe, mini or PC.

Try GML/PC™, a new breed of automated publisher from the company who brought you SPF/PC™.

CTC
Command Technology Corporation

1900 Mountain Blvd., Oakland CA 94611 (415) 339-3530 Telex: 509330

PRODUCT FACE-OFF
Pick a pair of Mac packages

BY RUSSELL LIPTON

At first glance, the Macintosh versions of Pagemaker and Interleaf Publisher have little in common.

Pagemaker from Aldus Corp. was custom-designed for personal computers, with its strength lying in page composition. Interleaf, Inc.'s Interleaf Publisher, originally developed for engineering workstations, was optimized to support cross-work-group management of large multidocument projects.

A closer look however, reveals something of a convergence. Pagemaker has added a variety of document management aids, and Interleaf Publisher, now available for micros, has picked up free-form page-layout capabilities. The fact that each runs on Apple Computer, Inc.'s Macintosh shows how desktop and corporate publishing are themselves meeting at the PC workstation.

Style conscious

Pagemaker Version 3.0 has been enhanced by features such as style-sheet support, including the ability to import some existing style sheets, and support of spot color.

From its origin, Pagemaker has been a cleanly designed product that supports stylish desktop publishing work. However, its word processing support is rather weak, providing limited direct functionality and few support aids. Furthermore, while Pagemaker has built a reputation for its graphical support, it is limited mainly to the layout process; the draw/paint process is barely addressed.

The persistent bugginess of the product, however, is its most troublesome aspect. Pagemaker freezes, misformats and otherwise plays strange tricks with material frequently enough to leave the heavy user frustrated. This bugginess applies, alas, to some output as well.

Eccentric but versatile

The Macintosh version of Interleaf Publisher has been on the market for only about six months. Its largest initial problem is its heavy resource consumption. On top of this, the product uses its own iconic and command structure, creating a desktop different from that of the Mac. This prevents users from using certain iconic commands, for example, in the same way they would on a Macintosh.

However, there are many positive things about Interleaf Publisher. Its interface, while eccentric, is intuitive and more context-sensitive than Pagemaker's. Interleaf provides the heavy-duty environmental support that its rival lacks.

Style sheets are integral to Interleaf Publisher. Documents are constructed as a series of linked textual and graphical objects. Each object has properties that can either be applied automatically or overridden during the editing process.

Graphics are created within frames through diagraming. Object grouping is provided in addition to rotation, isometric projection and other support operations. An image editor allows paint-style refinements on new or existing graphics.

> PAGEMAKER will remain the choice for short documents with extensive design. . . . Interleaf Publisher is ideal for lengthy documents with longer life cycles.

While it is not a dedicated word processor, the product can be used to write entire documents from scratch. It provides a total environment for producing sophisticated documents, from text creation through figure design to pasteup.

Interleaf Publisher does have some deficiencies. For example, it does not support kerning and cannot match Pagemaker's support of document zooming, facing page display and the printing of thumbnail sketches. In addition, it does not support either a color interface or direct design for color output.

Finally, document import is noticeably more awkward with Interleaf Publisher because of its revised desktop. While the import function itself seems solid, extra movements and command operations are required.

Long and short of it

Despite their gradually converging trajectories, each product is still targeted at different audiences. Pagemaker will remain the choice for users requiring short documents with extensive design and varied page layout as well as for documents with a short life cycle. For this audience, the $495 price is fair.

Interleaf Publisher is ideal for managing lengthy documents with longer life cycles and for environments in which many authors, revisers and artists must share work on the same documents. Considering the product's word processing and graphics features, its unequaled document management capability and its page layout and composition features, its $2,500 price is also fair.

Given the volume and variety of publishing tasks in today's corporations, these two products do represent complementary choices, and most companies could find reason to invest in them as a pair. •

Lipton is vice-president of Information Builders Publishing, Inc. and editor-in-chief of *Focus Systems Journal* in New York.

Looking for used equipment?

Get *used* to finding what you want — and saving time — with MARKETPLACE.

COMPUTERWORLD
MARKETPLACE

Shop for the products and services you need. Every week.

Scanning the horizon

BY BRUCE PAGE

Integration is currently the hottest buzzword in the scanner market.

Because performance differentiation in terms of dot-per-inch resolution and scanning speed is no longer as drastic as it once was, many top-of-the-line manufacturers are emphasizing integration as a way to distinguish their products in an increasingly crowded market.

Two kinds of integration are at issue in scanner technology. The first involves the bundling of separate scanning functions into a single unit. The second addresses the need to make scanners a functional part of a complete electronic publishing environment.

TO INTEGRATE the scanner into the office environment, it must be connected into the network.

In the first instance, since the task of pattern recognition required for optical character recognition (OCR) can be relegated to software, many of the most sophisticated systems existing today use a simple bit-map scanner bundled with easily upgraded applications — which do the real work.

Unfortunately, the hoopla over integration has led manufacturers to construct complete solutions in this fashion. Often, users would be better off choosing the hardware/software combinations that best meet their needs.

That is not to say there are no good, functionally integrated systems available. Kurzweil Computer Products, Inc.'a Discover 7320 is not only a standout OCR scanner but also a serviceable 300 dot/in. image scanner.

Beyond the combination of bit-map scanning and OCR lies what manufacturers now call integrated image-management systems, which combine scanning functions with information processing and communication functions.

Adapting to the environment

One company that has a foot in both doors is AEG-Olympia, which recently introduced a scanner system called Doc Master. Doc Master features the same capabilities as Discover but also includes an optical disk "jukebox" system for storage. This technology allows users to call up a virtually unlimited number of stored documents for graphical or textual editing.

Scanners are already capable of supporting multiple functions in an office. But to integrate a scanner into that environment effectively, it must be connected into the network.

The importance of image processing as a network application cannot be overestimated. One of electronic publishing's benefits is its ability to coherently organize the writing and production efforts of a work group; this cannot be accomplished without networking.

Doc Master is a good example of this kind of connectivity. It has an interface to IBM Systems Network Architecture networks as well as to standard office local-area networks.

Another example is Ricoh Corp.'s R2100 facsimile machine, which can provide scanning functions for large work groups, thanks to its asynchronous CCITT X.25 network interface.

An additional development takes integration one step further: It allows users the capability of scanning filmed as well as paper documents.

A scanner system jointly developed by Philips N.V., which invented optical disk technology, and Agfa-Gevaert, a traditional supplier of microfilm and microfiche systems, reads not only standard hard copy but also microfilm and then transfers it to optical disk.

Double standard

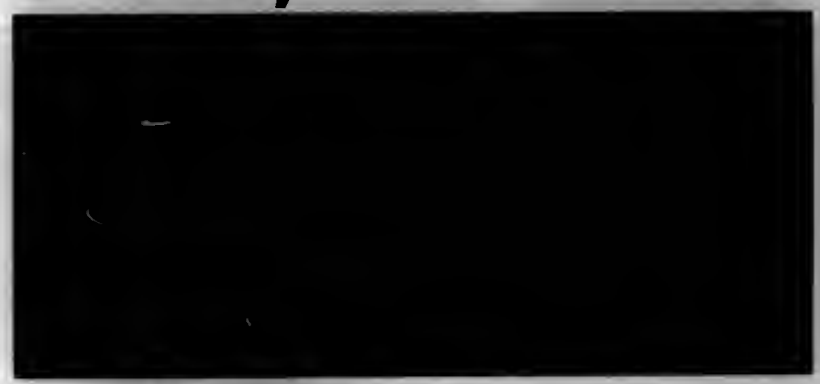
An important part of integrating image files with existing office equipment is ensuring that display and processing systems will be compatible with the growing base of image files.

Today, many different scanning standards exist, from the common 240 dot/in. standard to the 480 dot/in. one beginning to appear in Europe. Xerox Corp.'s Pro-Imager scanner solves most resolution questions with its scanning range of 72 to 600 dot/in., allowing it to produce compatible image files for nearly any display and image processing software.

Flexibility of this kind is becoming increasingly important, because the scanner is more than a desktop peripheral. Now generally recognized as an essential component of any electronic publishing system, the scanner will play an even greater role in the future as the link between paper publishing and electronic distribution media, such as facsimile and online data base services. •

Page is president of Magnetic Press, Inc., a New York-based research and intelligence firm specializing in emerging information and communications technologies.

WITHOUT MIS SUPPORT, EXECUTIVE DECISION MAKING IS TOUGH, LONELY BUSINESS.



HERE'S HOW MIS CAN HELP.

Choose IFPS/Plus from Execucom. It's the one and only management support system that satisfies the information needs of both executives and analysts. Without adding to the MIS development burden.

IFPS/Plus is the optimal foundation for building Executive Information Systems. With little or no training, executives gain direct access to critical business information. Customized reports and charts can be generated at the touch of a button. And details on any aspect of business are available to senior management with total ease and flexibility.

IFPS/Plus is also a powerful tool for analysts. Using common business terms, analysts can perform sophisticated modeling tasks, such as what-if and risk analysis, goal seeking and optimization. And the system's built-in artificial intelligence provides instant conversational explanations of how, why and where business variances have occurred.

From ad hoc analytical graphics to executive presentations, analysts can draw on the power of Execucom software to create a full range of charts and graphs, including logos and other free-form images. All produced with minimal time and effort.

IFPS/Plus also makes life easier for MIS. IFPS/Plus applications are built and maintained by using a descriptive, non-procedural language. Executive display systems can be developed quickly with menu-driven development capabilities. And with IFPS/Plus, there's only one integrated system to support for both executives and analysts.

Call us today. And discover why Execucom is the leader in management support systems for executives and analysts. You'll receive a free information packet when you call Evan Greer toll free at 1-800-531-5038. In Texas and Canada, call 512-346-4980.

EXECUCOM

Runs in Digital's VMS, Micro VMS and VAX Mate. Integrated with Digital's ALL-IN-1. digital™ Cooperative Marketing Program

Any company can take Only one can put

The moment IBM introduced the Personal System/2 family, the race was on to copy or "clone" the new technology.

Easier said than done. And here's why.

When IBM set out to make the new computers, we could have simply installed a more powerful chip into our top PC performer, as some computer companies are doing. To us, that's just pushing an older technology to its limits.

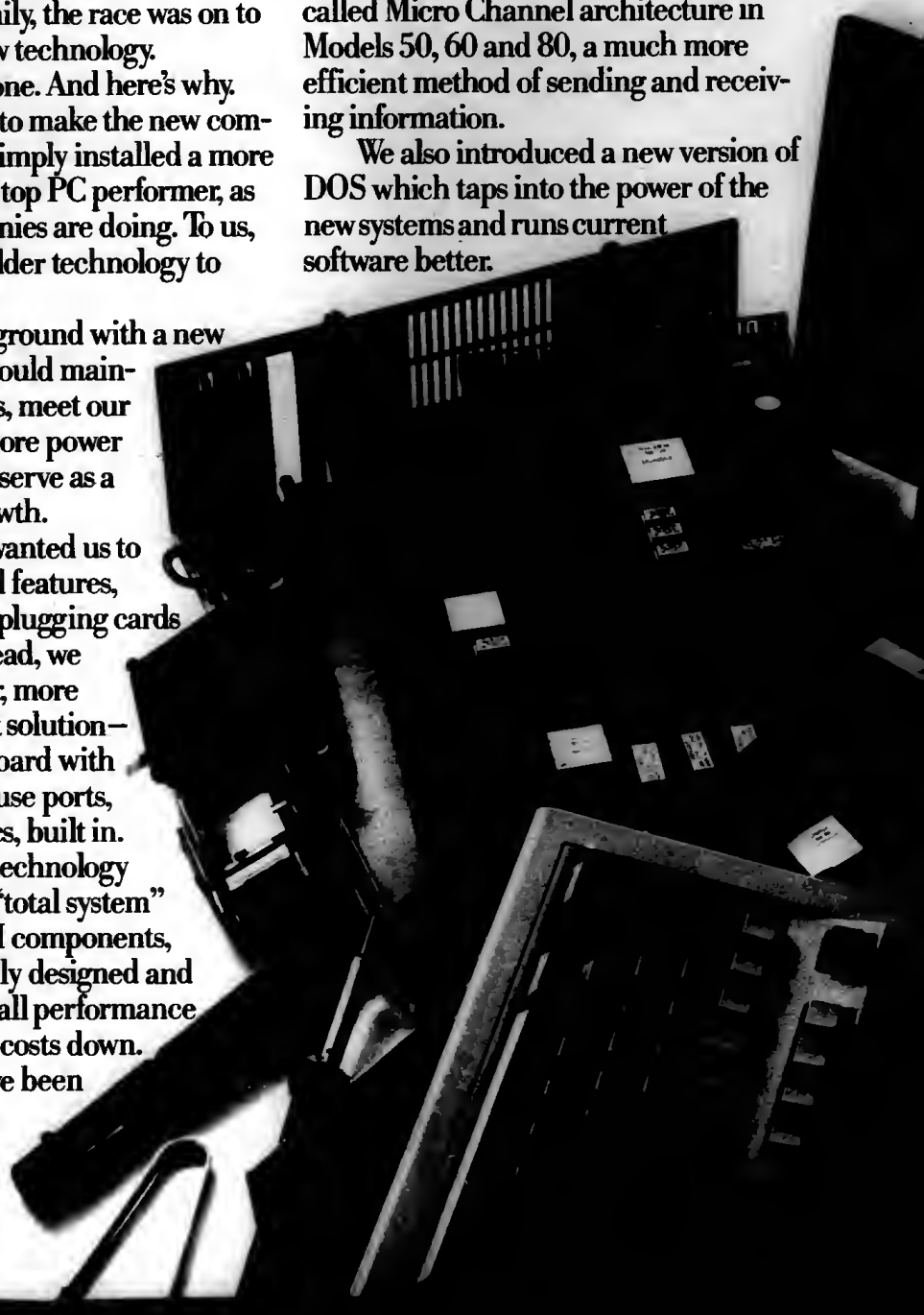
Instead, we broke ground with a new technology. One that would maintain links to earlier PCs, meet our customers' needs for more power and performance, and serve as a platform for future growth.

For instance, you wanted us to give you more standard features, and we did, but not by plugging cards into the machine. Instead, we came up with a quieter, more reliable, more compact solution—an integrated planar board with parallel, serial and mouse ports, even advanced graphics, built in.

In fact, the entire technology was developed from a "total system" philosophy—using IBM components, and IBM chips, specially designed and integrated to send overall performance and reliability up, and costs down.

We could even have been content to direct information through a traditional "single bus" highway. Instead, we created a superhighway called Micro Channel architecture in Models 50, 60 and 80, a much more efficient method of sending and receiving information.

We also introduced a new version of DOS which taps into the power of the new systems and runs current software better.



the IBM PS/2 apart. it all together.

And we just unveiled a new operating system, OS/2, that opens up a world of possibilities.

For starters, it's compatible with today's DOS, to protect your investment in hardware and software. It works beautifully with Micro Channel, to make multi-tasking easier. What's more, OS/2 establishes a consistent look for virtually all software and systems, part of a blueprint for the future we call Systems Application Architecture.

Even IBM's legendary dealer network has been improved. A special certification program gives dealers advanced training, so service and support are even stronger. In fact, support comes from many sources—right now, hundreds of outside developers are creating new cards, software and peripherals.

So you see, the world of the Personal System/2 is far greater than any single computer or chip or component. And if you don't keep your eye on The Bigger Picture, you can just wind up with lots of bits and pieces.

For more information, see your IBM Marketing Representative or authorized dealer. For the name of a dealer near you, call 1-800-447-4700.

IBM The Bigger Picture

IBM is a registered trademark, and Personal System/2, PS/2, OS/2 and Micro Channel are trademarks of IBM Corporation
© IBM 1988

Turnkey publishing systems

Apple Computer, Inc.
(408) 996-1010
Apple Desktop Publishing
Graphics-based desktop publishing systems. Configurations may include Macintosh Plus, Macintosh SE or Macintosh II, Laserwriter or Laserwriter Plus, Applelink, Appletalk or other Apple products.

Canon USA, Inc.
(516) 488-6700
Express Desktop Publisher
Includes what-you-see-is-what-you-get features. Canon A-200SX microcomputer with Intel Corp. 80386 chip, 40M-byte hard disk and 1M-byte random-access memory. Includes Canon's Image Scanner, LBP-CX laser printer and Expression Software.

Compugraphic Corp.
(617) 658-5600
Compugraphic Automated Publishing System
Based on Sun Microsystems, Inc.'s Sun-3 hardware platforms. Network-based system. Documents can be created on any input system, including micros and mainframe text editors. Output devices supported include laser printers and high-resolution scanners.

Digital Equipment Corp.
(617) 897-5111
Vaxstation Solution System
DEC Vaxstation-based publishing system using Interleaf, Inc.'s TPS software and DEC's LNO-3R Postscript printer. May be integrated with DEC's All-In-1.

Eastman Kodak Co.
(716) 724-1336
Kodak Ektaprint Electronic Publishing System
Input devices include intelligent character readers, scanners and workstations. Document composition software based on Interleaf, Inc. TPS. Output devices include Ektaprint 1392 laser printer.

IBM
(Contact local IBM dealer)
Solutionpac Personal Publishing System
Includes IBM Personal System/2 Model 30, PS/2 monochrome or color display, PS/2 mouse, IBM 4216 Personal Pageprinter and adapter. Software includes Adobe Systems, Inc. Postscript and Microsoft Corp. Windows.

Solutionpac Personal Publishing Option, Option/A
Configures IBM Personal Computer XT 286, PC AT and PS/2 Model 30 or Models 50, 60 and 80, respectively, as a publishing system. Includes same peripherals and software as the Solutionpac Personal Publishing System.

Solutionpac Publishing System VM Edition
Configures IBM 9370, 4300, 3080 or 3090 as publishing system. Includes IBM's Publishing Systems Processmaster, Bookmaster and Browsemaster.

IBM Interleaf Publisher
Full-function document processing and publishing application for the PS/2 Model 80 running PC-DOS. Version available for the IBM RT Personal Computer running AIX.

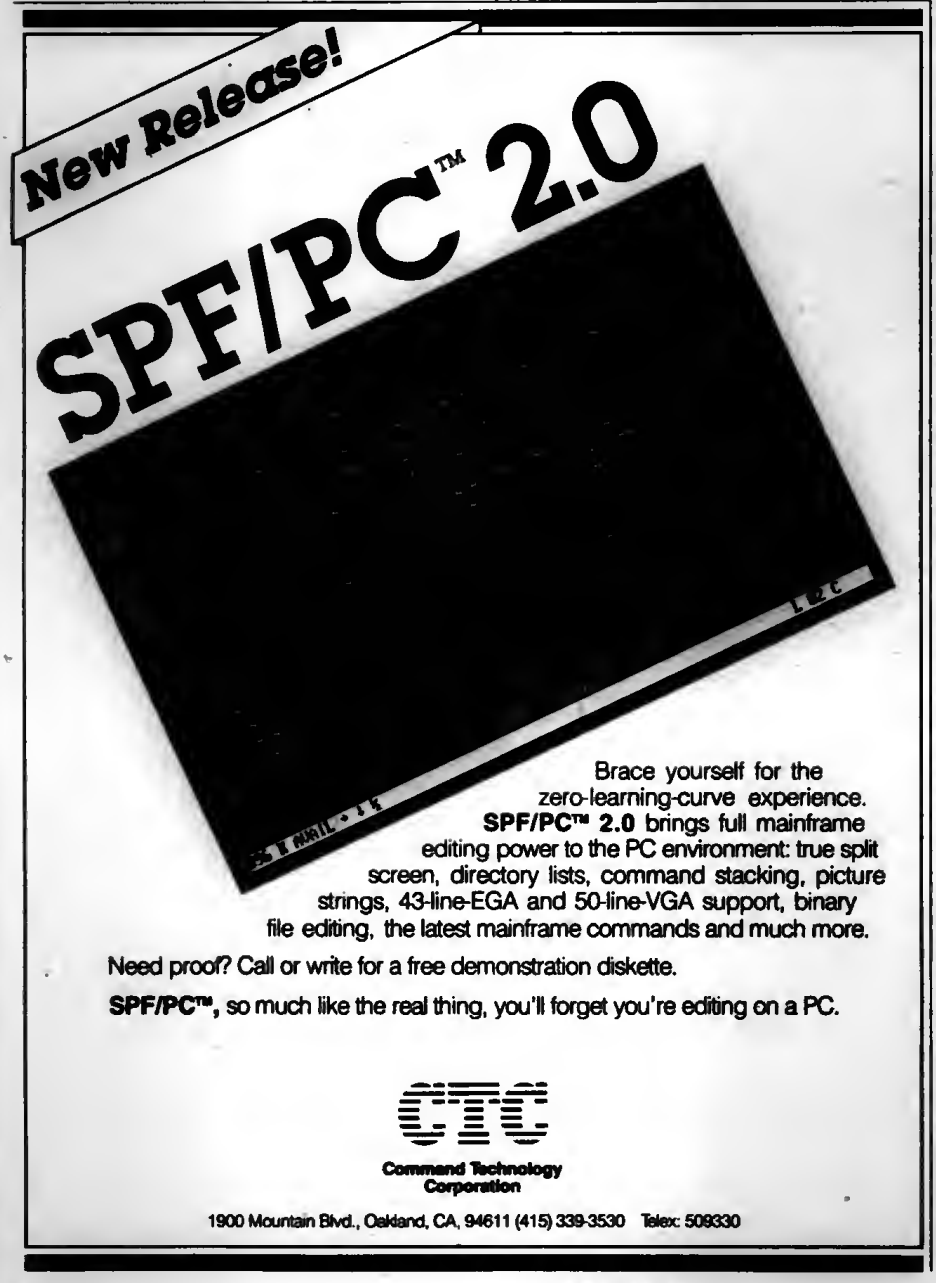
NBI, Inc.
(303) 444-5710
NBI 5000 series
Workstation-based publishing systems — Integrated Workstation, Pro-Publisher and Pro-Publisher Plus — incorporate what-you-see-is-what-you-get display with NBI laser printers and image scanners for output. Software includes document composition, chart and design graphics and communications. Turbo version of NBI Pro-Publisher Plus may be attached to NBI 500 series minis.

Penta Systems International, Inc.
(800) 63-PENTA
Integrated Publishing System
Automated publishing system allows manuscript editing, interactive page design composition and output on phototypesetters and laser printers. Based on Data General Corp. 32-bit architecture. Supports software on IBM Personal Computers and compatibles. Output devices include more than 25 phototypesetters and laser typesetters.

Qubix Graphic Systems, Inc.
(408) 292-4000
Qubix Designer Workstation
A turnkey electronic publishing system for technical illustrators and graphic artists. Consists of a Sun Microsystems, Inc. platform using Qubix's what-you-see-is-what-you-get monitor, a sonic pen and the Qubix Designer: Professional Illustration software. Interface capabilities allow illustrations created on the Designer workstation to be incorporated into documents from a variety of publishing software. Output drivers available for a variety of typesetters.

Scribe Systems
(412) 281-5959
Scribe Technical Electronic Publishing System
Electronic publishing system based on Scribe composition software package. Includes batch pagination software, networking software for linking micro-based authoring stations and other popular IBM Personal Computer page makeup and text processing packages. Supports minicomputers and high-resolution workstations, as well as a variety of output devices.

Wang Laboratories, Inc.
(617) 459-5000
Wang Desktop Publishing System
Includes the Wang 280 Professional, the Wang version of Aldus Corp.'s Pagemaker, Microsoft Corp.'s Windows, and the LCS15 laser printer with Adobe Systems, Inc. Postscript controller.



Brace yourself for the zero-learning-curve experience. **SPF/PC™ 2.0** brings full mainframe editing power to the PC environment: true split screen, directory lists, command stacking, picture strings, 43-line-EGA and 50-line-VGA support, binary file editing, the latest mainframe commands and much more.

Need proof? Call or write for a free demonstration diskette.

SPF/PC™, so much like the real thing, you'll forget you're editing on a PC.

Command Technology Corporation

1900 Mountain Blvd., Oakland, CA, 94611 (415) 339-3530 Telex: 509330

Page composition software

COMPANY	PRODUCT	HARDWARE	MEMORY REQUIRED (IN BYTES)	WORD PROCESSORS SUPPORTED	GRAPHICS PACKAGES SUPPORTED	OUTPUT DEVICES SUPPORTED	SCANNERS SUPPORTED	WYSIWYG[1]	AUTOMATIC COLUMN CREATION	AUTOMATIC HYPHENATION/ JUSTIFICATION	AUTOMATIC KERNING	INTEGRATION OF TEXT, GRAPHICS	CREATION/STORAGE OF FORMS	IMAGE MANIPULATION OPTIONS	PRICE
Aaera Plus, Inc. (213) 876-5357	Easy Laser	IBM PC, XT, AT and compatibles	80K	Any ASCII-based	None	All HP Laserjets	None	No	Yes	Both	No	No	Yes	None	$99.95
Advanced Vision Research, Inc. (408) 434-1115	Megascan	IBM PC, XT, AT and compatibles	640K	Any ASCII-based	All PCX, TIFF[2], IMG[3] file formats	HP Laserjet Series II	Proprietary, HP Scanjet, Canon IX-12	Yes	No	Neither	No	Yes	Yes	Cropping, enlargement, scaling, reduction	$2,695
Altsys Corp. (800) 628-5800	Pagemaker 3.0 for PC	IBM PC AT, PS/2 and compatibles	640K	Wordstar, Executive Memomaker, Microsoft Word, Multimate, Xywrite III, Wordperfect, Windows Write; TIFF[4], DCA[5], ASCII-based	All supporting Microsoft Windows	All supporting Windows, Postscript; Linotronic, Compugraphic and Varityper typesetters	All supporting TIFF	Yes	Yes	Both	Yes	Yes	Yes	Cropping, enlargement, proportional scaling	$795
	Pagemaker 3.0 for Macintosh	Macintosh Plus, Mac II, Mac SE	NP	Macwrite, Microsoft Word, Microsoft Works, Wordmarc, Wordperfect, Wordstar, Xywrite III; DCA, ASCII-based	Adobe Illustrator and Freehand, Cricket Draw and Graph, Canvas, Fullpaint, Macdraw, Macpaint, Macpaint, Superpaint, EPS, TIFF, Pict[7], Macpaint	Postscript-compatible lasers for Macintosh, Linotronic 100, 300	All supporting bit-map, TIFF	Yes	Yes	Both	Yes	Yes	Yes	Cropping, enlargement, proportional scaling	$889
Altos Computer Systems (408) 946-6700	AOM Deskset Publisher	Altos 1086, 2086, 3086, 386-2000, 386-1000, 3068	1M	AOM II Plus, Uniplex	PC Paintbrush	HP Laserjet Plus, Quadram Quadlaser, Canon LBA2	Microtek 300	No	Yes	Both	Yes	Yes	Yes	Resizing	$995
Arabetype, Inc. (617) 482-2720	Designer	Most 80286 and 80386 machines	2M - 8M	Any ASCII-based	All supporting Windows, EPS, TIFF or PCX	Postscript-compatible devices, Autologic APS-5, Micro 5, Compugraphic 8600, 8400, 8600, 9600, Monotype	All supporting PCX, TIFF	Yes	Yes	Both	Yes	Yes	No	Aspect, anamorphic, proportional, nonproportional scaling, individual tracking	$3,995 - $5,995
Ashton-Tate Corp. (213) 329-8000	Byline	IBM PC, XT and compatibles with a CGA[8], Hercules, Hercules Plus or EGA[9] graphics adapter	512K	Multimate, Advantage II, Wordstar, Wordperfect, Xywrite II, Xywrite III, ASCII-based	PC Paintbrush, Macpaint, Windowpaint, PC Paint, Fantasy Art Folders, T/Maker Clipart	Epson, IBM, Okidata 9- and 24-pin dot matrix; Toshiba Plus lasers; HP Laserjet Series II, Okidata Laser, Apple Laserwriter, Laserwriter Plus	All supporting PCX	Yes	Yes	Justification	Yes	Yes	Yes	Cropping, scaling	$295
Beaman Porter, Inc. (914) 636-3100	Powerfont Formatter	IBM PC, XT, AT and compatibles	512K	Any ASCII-based	Any	Any	Any	No	Yes	Both	Yes	Yes	Yes	No	$199
	Powerfont Bookmaker	IBM PC, XT, AT and compatibles	512K	Any ASCII-based	Any	HP Laserjet	Any	No	Yes	Both	Yes	Yes	Yes	No	$199
Bantisfo, Inc. (315) 891-6600	Superpage II	IBM PC, XT, AT and compatibles	640K	Any ASCII-based	Autocad, PC Paintbrush, HPGL[10]	All Postscript lasers; various typesetters	Datacopy, Imagitex	Yes	Yes	Both	Yes	Yes	Yes	HP	NP
Command Technology Corp. (412) 250-5830	GML/PC V3.0	IBM AT and compatibles, all 80386 machines	640K	Any ASCII-based	Autocad, Micrographx Ha-Vision, Windows Draw, Window Graph, Publishers Paintbrush, Freehand Plus; all offering EPS	HP Laserjet Plus and compatibles, Laserjet Series II, all Postscript	None	No	Yes	Both	Yes	Yes	Yes	None	$995
Content Corp. (503) 648-1981	Documentation Workstations	Apollo DN 3000, DN 4000 series	4M	Proprietary	Proprietary	Postscript; Imagen	All supporting TIFF, Apollo GMF	Yes	Yes	Both	No	Yes	Yes	Cropping, sizing, resolution scaling, edge enhancement, half-toning	$4,900-$19,900
Data Transformat, Inc. (800) 662-1001	Postrix	IBM PC, XT, AT and compatibles	512K	Any ASCII-based	Proprietary	More than 100 dot matrix; thermal, ink-jet, laser	None	Yes	Yes	Justification	No	Yes	Yes	Independent magnification, cropping, negative image and color printing	$155
	Postrix for Apple II	Apple II Plus, IIC, IIE, IIGS	64K	None	Proprietary	More than 150 dot matrix; thermal, ink-jet, laser	None	Yes	No	No	No	Yes	Yes	Independent magnification, cropping, negative image and color printing	$95
	Postrix	IBM PC, XT, AT and compatibles	256K	Microsoft Word, Wordstar, Wordstar 2000, Wordperfect, Displaywrite Writer, ASCII-based	Proprietary	More than 150 dot matrix; thermal, ink-jet, laser	None	No	No	Justification	No	Yes	Yes	Independent magnification, negative image printing, cropping, color printing	$195
	Printrix for Apple II	Apple IIE with extended 80-col card, IIC, IIGS	128K	Appleworks, Wordperfect, Word Juggler, Applewriter II, ASCII-based	Proprietary, Printshop	More than 150 dot matrix; thermal, ink-jet, laser	None	No	Yes	Justification	No	Yes	Yes	Magnification, color printing, positioning	$95
Digital Equipment Corp. (Contact local sales office)	DEC Page	VAX/VMS	Varies	WPS Plus	Any Regis-compatible format, EPS	Postscript, LN01, LN03, LN03 Plus, LN01.5, Printserver 40	Microtek	No	Yes	Both	Yes	Yes	Yes	Cropping, enlargement rotating, flipping	$3,150-$18,900
Digital Research, Inc. (408) 649-3896	GEM Desktop Publisher	IBM PC, XT, AT and compatibles, PS/2, 3270-PC	512K	GEM Draw Plus, GEM Graphics, GEM Paint, GEM Write, Wordstar, Wordperfect, Multimate; ASCII-based	Proprietary, all applications supporting GEM[11], IMG	Apple Laserwriter, Laserwriter Plus; HP Laserjet Plus and compatibles, Pclmod Printer; Epson EX, FX, JX, LX, MX, LQ series; IBM Proprinter, Graphics Printer, Color Jetprinter; Xerox 4020 Color Inkjet	All supporting GEM or IMG	Yes	Yes	Both	No	Yes	Yes	Scaling, cropping	$299
Frame Technology Corp. (408) 433-3311	Frame Maker	Sumatrasun 2, 3, 4; Sony News Workstation; Interfirm Graphics Workstation; Tektronix 4300 series	2M	Built-in, any ASCII-based	Macdraw, Macpaint	All Postscript, Imagen compatibles	All supported by Sun hardware	Yes	Yes	Both	No	Yes	Yes	Scaling, cropping	$2,500
G. O. Graphics, Inc. (617) 229-8000	Deskset Design Edition	All MS-DOS machines	640K	Any ASCII-based	PC Paintbrush, Dacstar Rule II, Microtek Inter, Datacopy WPS, Lotus 1-2-3, Symphony Graphics	HP Laserjet; all lasers with Canon engines; Kaser Plus; Compugraphic typesetters	Microtek, Datacopy, Canon	No	Yes	Both	Yes	No	Yes	HP	$1,995

[1]WYSIWYG: What-you-see-is-what-you-get [2]TIFF: Tag image file format [3]IMG: Bit image format [4]WP: International Word Processing Association [5]DCA: Digital Communications Associates, Inc. [6]EPS: Encapsulated Postscript [7]Pict: A picture file format [8]CGA: Color Graphics Adapter [9]EGA: Enhanced Graphics Array [10]HPGL: HP printers [11]GEM: Object format [12]IGES: Initial Graphics Exchange Specification [13]IFF: Image file format [14]PCL: HP lasers and compatibles [15]PSX: Microsoft bit-mapped file format [16]DXF: Data exclusive file

The companies included in this chart responded to a recent telephone survey conducted by *Computerworld*. When a vendor is unable to provide specific information about its product, this is designated NP (not provided). When a question does not apply to a vendor's product, this is designated NA (not applicable). Further product information is available from the vendors.

COMPANY	PRODUCT	HARDWARE	MEMORY REQUIRED (IN BYTES)	WORD PROCESSORS SUPPORTED	GRAPHICS PACKAGES SUPPORTED	OUTPUT DEVICES SUPPORTED	SCANNERS SUPPORTED	WYSIWYG[1]	AUTOMATIC COLUMN CREATION	AUTOMATIC HYPHENATION/ JUSTIFICATION	AUTOMATIC KERNING	INTEGRATION OF TEXT, GRAPHICS	CREATION/STORAGE OF FORMS	IMAGE MANIPULATION OPTIONS	PRICE
G. G. Graphics, Inc. (617) 235-8000	Dashes Bones Pak	All MS-DOS machines	640K	Any ASCII-based	PC Paintbrush, Doctor Halo II, Microtek Imar, Datacopy WPS, Lotus 1-2-3, Symphony Graphics	Epson dot matrix	Microtek, Datacopy, Canon	No	Yes	Both	Yes	No	Yes	NP	$495-$695
Good Ideas (617) 475-7238	Type-Set-It	IBM PC, XT, AT, PS/2 and compatibles	512K	Any ASCII-based	None	All IBM, Epson dot matrix and compatibles	None	Yes	Yes	Both	Yes	No	Yes	None	$395
Blue ray (800) 351-0000	Page Composition Package	IBM PC, XT, AT and compatibles	256K	Any ASCII-based	All supporting PCX	All HP lasers and compatibles	None	No	Yes	Both	Yes	Yes	Yes	Resizing	$595
Image Network, Inc. (415) 967-0642	Xroff	All supporting Unix, VMS	256K	Proprietary	Pict	All lasers; Autologic APS, Compugraphic typesetters	None	No	Yes	Both	No	Yes	Yes	Scaling	$950-$20,000
[illegible] (800) 000-GRAF (800) 000-GRAF (Calif.)	Page Perfect	IBM AT and compatibles, PS/2	640K	Built in; also Wordperfect, Wordstar, Multimate, Displaywriter	All HP LaserJets, all cartridge Toshiba, Epson, NEC 24-pin dot matrix	All	Yes	Yes	Yes	Both	Yes	Yes	Yes	Enlarging, reduction, scaling, cropping, flipping, rotating	$495
Intergraph Corp. (205) 772-2000	DP/Publisher	Clipper-based workstations	6M	NP	Proprietary, graphics translated via IGES[2]	All Postscript	Intergraph E.Scan, Imagitex, Optronics 4040	Yes	Yes	Both	Yes	Yes	Yes	Zoom in and out, center, define area, move, scale, fit, layer, selective edit, resolution locks	$2,000 per workstation
Interleaf, Inc. (617) 491-0000	Interleaf Technical Publishing Software	Sun, Apollo, DEC, IBM workstations	4M	Any ASCII-based	Built-in, Macdraw, Macpaint	Interleaf lasers, Apple LaserWriters, monotype-compatible Compugraphic, Autologic typesetters	Imagitex, Datacopy	Yes	Yes	Both	Yes	Yes	Yes	Cropping, enlargement, rotating, scaling, airbrushing	From $6,000
	Interleaf Publisher	Macintosh II	4M	Built-in, Macwrite, Microsoft Word	Built-in, Macdraw, Macpaint, Pict II, TIFF, EPS	Apple LaserWriter, Linotronic	All supporting TIFF	Yes	Yes	Both	Yes	Yes	Yes	Cropping, enlargement, rotating	$2,495
Bolt Graphic Corp. (800) 880-1400	Personal Typesetting Workstation	IBM XT, AT and compatibles	512K	Wordstar, all ASCII-based	GEM Desktop	Dugtek 5000, IGX 7000 typesetters; Dugtek IGX 400 lasers	Panasonic FX	Yes	No	Both	Yes	Yes	Yes	Sizing, positioning	$1,000 (lasers), $4,000 (typesetters)
[illegible] (408) 438-8770	Jamtext	All Macintosh	512K	Built-in	Postscript	Postscript	None	No	Yes	Both	Yes	Yes	Yes	Cropping	$195
Lexmax, Inc. (812) 914-1600	Highstyle	IBM PC, XT, AT, PS/2 and compatibles	512K	Any ASCII-based	PC Paintbrush	HP Laserjet and compatibles	None	No	Yes	Both	Yes	Yes	Yes	Cropping, enlargement	$300
Letraset USA (201) 845-6100	Ready, Set, Go	Macintosh 512K and up	512K	Any ASCII-based	TIFF, EPPF, Macpaint, EPS	All Postscript-compatible, Linotronic	Any supporting TIFF, EPPF, Macpaint, EPS	Yes	Yes	Both	Yes	Yes	Yes	Enlargement, scaling, cropping, reduction	$495
Magnus Computer Systems, Inc. (510) 900-0333	Magnatype	All IBM PC-DOS compatibles, including PS/2	640K	Wordstar, Multimate, Microsoft Word, Wordperfect, IBM Displaywrite, Xywrite; all ASCII-based	Microcheck, PC Paint, PC Paintbrush, Publishers Paintbrush	Postscript, all Linotype, Compugraphic Varityper, Autologic, Monotype, Berthold, IBM typesetters	Microtek, Datacopy, Imagitex	Yes	Yes	Both	Yes	Yes	Yes	None	$7,500
	Magnalite	All IBM PC-DOS compatibles, including PS/2; must run on a LAN	640K	Wordstar, Multimate, Microsoft Word, Wordperfect, IBM Displaywrite, Xywrite; all ASCII-based	Microcheck, PC Paint, PC Paintbrush, Publishers Paintbrush	Postscript, all Linotype, Compugraphic Varityper, Autologic, Monotype, Berthold, IBM typesetters	Microtek, Datacopy, Imagitex	Yes	Yes	Both	Yes	Yes	Yes	None	$13,500
Media Cybernetics, Inc. (301) 495-3305	Halo Desktop Publishing Editor	IBM PC, XT, AT, PS/2 and compatibles	512K	Any ASCII-based	Any Halo-based	Dot matrix, ink-jet, all Canon, Hitachi, HP lasers	Canon, Hitachi, IBM, HP, Dest, Datacopy, Cannonscan, Microtek, Panasonic, Princeton	Yes	Yes	Neither	No	Yes	No	Full painting, zooming, editing	$195
Megahaus Corp. (619) 480-1230	First Impressions 1200	IBM PC AT	640K	Wordstar, Microsoft Word, Multimate, Wordperfect, Displaywrite	Versacad, Autocad, PC Paintbrush, Lotus PIC, Cadkey	All HP Laserjets and compatibles, Postscript, Imagen	Dest, HP Scanjet, Microtek, Datacopy	Yes	Yes	Both	Yes	Yes	Yes	Cropping, enlargement, creation	$695
Microsoft Corp. (206) 882-8080	Pagemaker	IBM PC and compatibles, PS/2	640K	Microsoft Word	Microsoft Windows, Windows/286	HP Laserjet	NP	Yes	Yes	NP	NP	Yes	Yes	Resizing	$49.95
Omnipage Corp. (716) 385-8068	Omnipage Electronic Publishing Software	Sun-3, HP Series 5000 Models 330, 350	4M	Any	All supporting HPGL, Calcomp 960	All Postscript, Imagen, Xerox 9700; Compugraphics Autologic APS-5, Linotype typesetters	Datacopy, Microtek, HP Scanjet	Yes	Yes	Both	Yes	Yes	Yes	Sizing, placement, rotation, annotation	$14,500 (first copy)
Panasonic Graphics Systems (800) 272-1000	Pagemark	IBM AT and compatibles	512K	Any ASCII-based	Studiowerks	Matrix PCR, QCR, Postscript	Thretek	Yes	Yes	Justification	No	Yes	Yes	Cropping, enlarging	NP
Penta Systems International, Inc. (800) 63-PENTA	Makeup Master	Data General DS7500 workstation	6M	NP	Any supporting TIFF, IMG, PCX	All Postscript lasers, Tegra, QMS, Linotronic 300, other phototypesetters	Datacopy, Abaton, Microtek, NP, AST, Canon, Dest, Imagitex	Yes	Yes	Both	Yes	Yes	Yes	Positioning, cropping, scaling, rotating	$50,000
Presoft, Inc. (818) 708-4444	Postmy	IBM PC and compatibles	512K	None	None	Dot matrix, HP Laserjet, Laser Plus	None	Yes	Yes	Both	Yes	Yes	Yes	Cropping, resizing, rotating, mirroring, negative, move, save, combining	$69.95
Quark, Inc. (303) 934-2211	Xpress 2.0	Macintosh Plus	1M	Microsoft Word, Microsoft Works, Macwrite, Writenow, all ASCII-based	TIFF, EPSF, Pict, RIFF, bit-map	Postscript	All supporting TIFF, EPSF	Yes	Yes	Both	Yes	Yes	Yes	Scaling, cropping, enlargement	$795
Quintet Graphic Systems, Inc. (408) 365-0606	Quintet Designer: Professional Illustration Software	Sun-3/50, 3/60, 3/140, 3/150, 3/160, 3/180 series	4M	All ASCII-based	Supports IGES I/O	Canon CX, SX; Dotsetter/Dot LZR-3000; Postscript; Autologic APS-5, APS-105, APS-4; Monotype	Datacopy 730	Yes	No	Both	Yes	Yes	Yes	Cropping	NP
Savvah Corp. (617) 861-0630	Easy Text and Graphics Plus	IBM PC, PS/2 and compatibles	384K	Proprietary	Proprietary	Daisywheel, dot matrix, laser	None	Yes	No	Neither	No	Yes	Yes	Enlargement, reduction	$89.95
Soundcraft, Inc. (800) 422-8004	Soundwriter	IBM PC and compatibles	384K	Any ASCII-based	All Postscript, EPS, TIFF, PCX, IFF*, Macpaint	All Postscript printers and typesetters, all QMS, PCL**	Panasonic, Dest, Datacopy, Microtek	No	Yes	Justification	Manual	Yes	Yes	No	$995
Softcraft, Inc. (800) 351-0500	Fancy Font	IBM PCs and compatibles	256K	Any ASCII-based	All TIFF, PCX	All lasers, dot matrix	All TIFF scanners	No	Yes	Both	Yes	Yes	No	Cropping, scaling	$180
Software Publishing Corp. (415) 962-8910	PFS: First Publisher	IBM PC, XT, AT, PS/2 Models 30, 50, 60 and compatibles	512K	PFS: First Choice, PFS: Professional Write, PFS: Write	Microsoft Windows Paint, Macpaint, PC Paint Plus, PC Paintbrush, Publishers Paintbrush	Laserjet, Laserjet Plus, Laserjet Series II, Apple LaserWriter, LaserWriter Plus	NP	Yes	Yes	Justification	Yes	Yes	Yes	Enlargement, flipping	$99
Spellbinder Software Products, Inc. (516) 788-3630	Spellbinder Desktop Publishing	IBM PC	384K	Proprietary, all ASCII-based	PC Paintbrush, Publishers Paintbrush, Lotus 1-2-3, Doctor Halo, Autocad	HP Laserjet, Laserjet Series II and compatibles	All outputting PCX files	Yes	Yes	Both	Yes	Yes	Yes	Enlargement, shrinking	$695

COMPANY	PRODUCT	HARDWARE	MEMORY REQUIRED (IN BYTES)	WORD PROCESSORS SUPPORTED	GRAPHICS PACKAGES SUPPORTED	OUTPUT DEVICES SUPPORTED	SCANNERS SUPPORTED	WYSIWYG[1]	AUTOMATIC COLUMN CREATION	AUTOMATIC HYPHENATION/ JUSTIFICATION	AUTOMATIC KERNING	INTEGRATION OF TEXT, GRAPHICS	CREATION/STORAGE OF FORMS	IMAGE MANIPULATION OPTIONS	PRICE
Systemation Corp. (800) 727-5150	Crystal Document Management System	AT&T 3B series; Altos 686, 586, 3000, 3068; Sun-3 series; 3088; PCS Tecmar; Ungermann-Bass 2000 series; 3088; Xenix PCIy series; 3088; Unix PCs; Toshiba T3300	8M	Any ASCII-, DCA-based	Mergelist, Autograph, Conformis	HP	No	No	Yes	Both	Yes	Yes	Yes	None	$95K
Tektronix Systems, Inc. (619) 587-0787	Transport	All running VAX/VMS, IBM PC and compatibles	NP	Any ASCII-based	Supported through Qdrive	All Tektronix lasers except Postscript	NP	No	Yes	Both	Yes	Yes	Yes	Through Qdrive	$600
	Qdrive	All running VAX/VMS, IBM PC and compatibles	NP	All supported by Tektronix Quic	All Computer Associates, SPSS, SAS Institute	Tektronix Quic	NP	No	No	Yes	NP	Yes	Yes	Reduction	$5,900
Trend Corp. (617) 942-8000	Live Image Electronic Publishing System	Sun-3	4M	Any ASCII-based	Mentor, Mentor, Autocad, Autocad, Quick Designer	Postscript, Interpress, CO3000, 3000, 1200	ECRM, Polaroid, Sanyo	Yes	Yes	Both	Yes	Yes	Yes	Cropping, resizing, flipping	$50,000
Unison World (415) 848-0666	Newsmaster II	IBM PC, XT, AT and compatibles	512K	Any ASCII-based	Screen capture utility for Lotus, PC Paint, most other graphics running MS-DOS	Dot matrix, lasers with 1.5M bytes or more with Epson emulation	None	Yes	Yes	Justification	No	Yes	No	Cropping, enlargement, resizing, flipping	$70
White Galaxy, Inc. (800) 999-9987	Pagebuilder	IBM PC and compatibles	640K	Any ASCII-based	All PRINT, EDIT*	All via Ventura[2]	Canon IX10	Yes	No	Justification	Yes	Yes	Yes	NP	$695
Xerox Corp. (213) 333-7000	Ventura Publisher	IBM PC and compatibles	512K	Any ASCII-based	Autocad, GEM Draw, GEM Graph, Dexter Halo DPE, DXF, PCX	Lasers, ink-jets, including Apple, AST, Cordata, HP, Xerox, IBM, Epson	All supporting PCX, EPS, GEM Image	Yes	Yes	Both	Yes	Yes	Yes	Cropping, enlargement, resizing, reduction	$995

VENDOR VIEWPOINT
Why not publish on a mainframe?

BY P. C. McGREW AND W. D. McDANIEL

If you have invested in an IBM mainframe system or are planning to do so, why not investigate ways to meet your document publishing requirements within that environment?

Performing in-house publishing on the corporate mainframe allows quick and efficient updating of a document's form and content. Data stored on the mainframe can be integrated with documents as they are being prepared for printing, and such printing can be performed on demand.

Furthermore, for an organization that usually jobs out its printing, mainframe-based in-house publishing means a substantial reduction in outside and in-house labor costs.

As with any major change in corporate direction, evaluating your needs and potential impact on the company is a necessary prelude to action.

The first question to address is, how many changes in business procedure will it entail? The list of potentially affected procedures is a long one, covering everything from job descriptions to work flow. You must determine what can change before you make plans.

Next on the list of questions is the impact on your existing data center. What will happen if you increase the number of people attached to your system and change their storage requirements? Consider the cost savings gained by automating the publishing process. You may even find you can expand your computing capacity and still realize major cost benefits.

If you do not already have text composition, graphics and print-handling software installed, find out what is available and what will best serve your needs.

Look at your documents

This brings us to a third evaluative task — determining your publishing requirements.

Publishing comes in many flavors. Some organizations create documents that contain only text; others add graphics such as business charts and halftones. Some businesses use the same documents and formats year after year; others vary their output frequently.

Another consideration is the look and feel of the documents you produce. As you look at your current document inventory, determine how many variations in design there are. Use this knowledge to question potential systems vendors about their ability to support your requirements.

Another issue, both related to and separate from publishing considerations, is laser printing requirements. It is important to decide whether you need high-speed or high-quality printing. These are not mutually exclusive, but usually only one is the driving factor in choosing the printer.

Whether you already own a mainframe-attached laser printer and are trying to decide whether it can handle your printing needs or are starting from scratch, the functional considerations are the same — print speeds, uptime averages and environmental requirements.

For example, if you are looking for a laser printer to operate within a production environment, you need to choose one that operates in the 50 to 100 page/min speed. Graphics and other enhancements will make the printer run slower. Compatibility with host-based composition and graphics packages is also an important consideration.

Keeping up

The addition of printer hardware and software is also a major cost consideration, but there are long-term benefits associated with gaining control of your publishing environment. The challenge is to keep up with what is available so that the appropriate pieces are chosen.

IBM's mainframe Document Composition Facility (DCF) is an excellent way to create well-designed documents for printing on IBM host-attached laser printers. IBM has also announced features of DCF 3.2, scheduled to be available May 20, to permit Adobe Systems, Inc. Postscript output and connection to IBM's office-based systems.

Office Document Feature is a part of DCF 3.2 that allows the transfer and translation of documents between DCF and Displaywrite, the IBM stand-alone word processing system. Software to permit use of DCF with printers from other vendors is also available.

> CONSIDER the cost savings gained by automating publishing. You may even find you can expand your computing capacity and still realize major cost benefits.

Mainframe-based graphics packages are also available. In IBM shops, the usual tool is Graphical Data Display Manager (GDDM), often supplemented with a variety of utilities. GDDM graphics can be called from DCF source files but maintained separately.

Hardware technology changes almost as quickly as software does. IBM recently introduced two Advanced Function Printing laser printers rated at 88 and 92 page/min, fueling the high-speed printer wars between itself and Xerox Corp. Small printers, however, are becoming both more prevalent and more sophisticated. Many of these can be attached to the mainframe to permit proof printing for document production areas. Many desktop duplex printers have fallen below $10,000.

Another emerging technology is low-cost, high-quality document image systems. Both scanning and optical disk technologies fall into this group.

Scanners are capable of imaging documents and graphics at 240 or 300 dot/in., at a cost of less than $3,000. Optical write-once, read-many drives can store hundreds of thousands of documents for a fraction of the cost of magnetic disks.

Departmental computing with processors like the IBM 9370 offers in-house publishers the opportunity to continue using the mainframe tools they have grown used to but with a freedom previously reserved for personal computer users.

Recently, affordable desktop printers and scanners have proliferated, coupled with the ability to compose documents on mainframes for output on printers traditionally associated with PCs. The opportunity already exists to establish a truly versatile in-house publishing system that supports mainframe-based demand printing in both draft and final quality and quantity.

It is safe to say, however, that we will see an increased level of software and hardware functionality, lower costs, integration between the diverse architectures and an improvement in software tools. These changes will provide more organizations with enhanced access to mainframe-based demand publishing within their price ranges. •

McGrew and McDaniel, authors of *In-House Publishing in a Mainframe Environment*, are with Image Sciences, Inc. in Dallas.

Big picture

FROM PAGE S3

committed to "mainstream software platforms" and emerging software standards such as Unix.

Some users are unconcerned about the potential disadvantages of proprietary hardware.

For them, specific publishing functionality, whether available on proprietary or standard equipment, may be the key. Larger corporations seem less concerned with the differences between the two types of electronic publishing systems.

While acknowledging the advantages of mainstream equipment, consultant Romano says, "Unfortunately, standardized hardware often becomes obsolete faster than proprietary hardware." He notes the numerous models introduced by several general hardware manufacturers.

Leading force

While this debate continues, advances in peripheral hardware are helping to both push electronic publishing and steer it in new, unexplored directions. High-speed laser printers have made on-demand printing a major application that will likely continue to attract companies to in-house publishing.

Rather than print employee handbooks, user documentation, forms, policy and procedure manuals and other publications in advance, companies like First Boston can now wait until the last minute.

"That way, we always have the latest version in circulation, we avoid storage charges and we can schedule work over a long period of time instead of doing a big job all at once," says Jack Dunn, the firm's manager of reprographics.

A tie-in to electronic distribution and the maintenance of document data bases is optical disk technology. Apple's compact disk-style external drive and implementations of optical disk technology by other manufacturers have a lot of people intrigued by the medium's possibilities as a low-cost, comparatively dense storage and transfer device.

By far, the most talked about new technology, however, is color. Some companies have installed stand-alone film slide-output devices, which are generally not integrated within the electronic publishing loop.

This situation will probably change in the future. But the major future topics in color are laser-generated spot color for presentation graphics and the ability to manipulate color electronically to obtain higher quality outputs.

> "Unfortunately, standardized hardware often becomes obsolete faster than proprietary hardware."
>
> FRANK ROMANO
> *TYPEWORLD*

The fine print

With so many rosy possibilities for electronic publishing's future, it is not surprising that one or two notes of caution have been spoken by users and consultants alike.

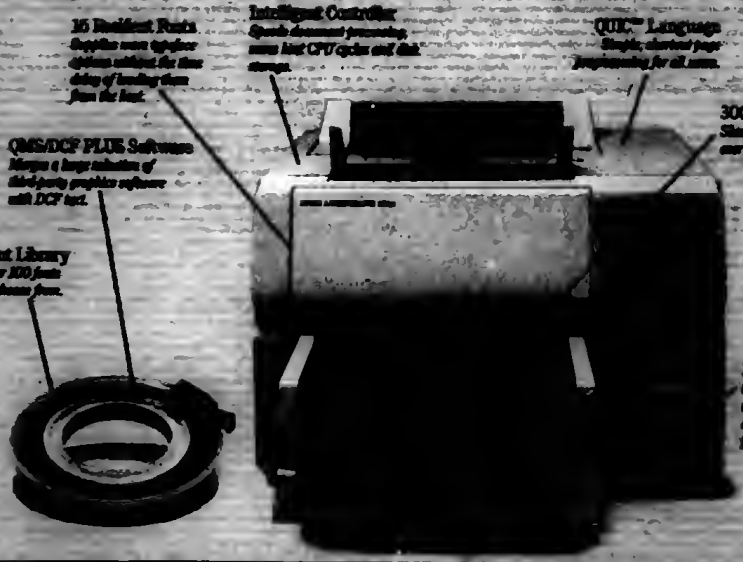
Corporate managers are concerned about finding, training and keeping employees who can learn to operate the equipment, understand the company's business and work in the graphic designer's environment imposed by the software.

They must address internal questions about pay scale and career paths for what amounts to a whole new type of employee.

Another caveat concerns the sheer complexity of the technical issues involved in making all aspects of an electronic publishing system work in a particular environment.

According to First Boston's Ervin, who also teaches various computer subjects as a professor at New York University's Business School, "Electronic publishing is probably the most complex manifestation of applied computer science around. You are dealing with networking, naked operating systems and a surfeit of file formats. Nothing quite meshes yet." ●

Introducing a fast way to improve your composition skills.



The new QMS/DCF PLUS 1510 solution set offers new ways to make your IBM® Advanced Function Printing (AFP) software more useful.

It speeds document processing. Reduces mainframe overhead. Lets users print AFP documents in their work groups. Makes it easier to use graphics software like SAS/GRAPH® and CA-DISSPLA™. And it works transparently with AFP without interfering with IBM functionality or software maintenance support.

These powerful capabilities come from an ingenious combination of QMS software and hardware innovations.

QMS/DCF PLUS is the software bridge between Lasergrafix® printers and AFP. It also lets you merge third-party vector graphics with DCF text. This saves the time of reformatting other vendors' graphics with GDDM before printing.

As a hardware solution, the 15-page-per-minute Lasergrafix 1510 has a 16-MHz controller with 6-MB RAM. This relieves your mainframe of page-composition overhead. So things get done easier. Better, too, thanks to 300x300-dot-per-inch resolution.

The desktop-size Lasergrafix 1510 also connects to IBM's 3270 network. So people throughout your company have access to AFP composition and production facilities.

For more information on improving your composition skills, call 1-800-631-2692, ext. 106.

QMS®
More Useful Solutions.

The following are trademarks of their respective companies: IBM of International Business Machines Corp., SAS/GRAPH of SAS Institute, CA-DISSPLA of Computer Associates, QMS, Lasergrafix and QUIC of QMS, Inc. ©1988 QMS, Inc.

Reading someone else's copy of Computerworld?

Get your own — You deserve it!

YES! I want my own subscription to COMPUTERWORLD. I'll pay just $44 for 51 weekly issues — that's only 86¢ per copy. In addition, I'll receive 12 FREE issues of COMPUTERWORLD FOCUS.

FIRST NAME M.I. LAST NAME

TITLE

COMPANY

ADDRESS

CITY STATE ZIP

Address shown: ☐ Home ☐ Business

For faster service call 1-800-255-6286! In NJ call 1-800-322-6286.

Canada, Central America & South America $110/Europe $165. All other countries $245 (Airmail)
Foreign orders must be prepaid in U.S. dollars.

Please complete the information to the right to qualify for this special rate.

COMPUTERWORLD

1 BUSINESS INDUSTRY (Circle one)
10. Manufacturer (other than computer)
20. Finance/Insurance/Real Estate
30. Medicine/Law/Education
40. Wholesale/Retail/Trade
50. Business Service (except DP)
60. Government — State/Federal/Local
33. Communications Systems/Public Utilities/Transportation
70. Mining/Construction/Petroleum/Refining/Agric.
80. Manufacturer of Computers, Computer-Related Systems or Peripherals
35. Computer & DP Services, including Software/Service Bureau/Time Sharing/Consulting
36. Computer/Peripheral Dealer/Distributor/Retailer
75. User, Other _____
99. Vendor, Other _____
(Please specify)

2 TITLE FUNCTION (Circle one)
IS/MIS/DP MANAGEMENT
19. Vice President, Asst. VP
31. Dir., Mgr., Supvr., IS/MIS/DP Services
22. Dir., Mgr., Supvr., of Operations, Planning, Adm. Services
23. Dir., Mgr., Supvr., Analyst, of Systems
31. Dir., Mgr., Supvr., of Programming
32. Programmer, Methods Analyst
28. Dir., Mgr., Supvr., QA/WP
38. Data Comm., Network Systems Mgr.
OTHER COMPANY MANAGEMENT
11. President, Owner/Partner, General Mgr.
13. Vice President, Asst. VP
13. Treasurer, Controller, Financial Officer
41. Engineering, Scientific, R&D, Tech. Mgr.
51. Sales/Mktg. Mgr.
OTHER PROFESSIONALS
38. Consulting Mgr.
70. Medical, Legal, Accounting Mgr.
80. Educators, Journalists, Librarians, Students
36. Others _____
(Please specify)

3 COMPUTER INVOLVEMENT (Circle all that apply) Types of equipment with which you are personally involved either as a user, vendor, or consultant
A. Mainframes/Supermini
B. Minicomputers/Small Business Computers
C. Microcomputers/Desktops
D. Communications Systems
E. Office Automation Systems
F. No Computer Involvement

348617-6

Reading someone else's copy of Computerworld?

Get your own — You deserve it!

YES! I want my own subscription to COMPUTERWORLD. I'll pay just $44 for 51 weekly issues — that's only 86¢ per copy. In addition, I'll receive 12 FREE issues of COMPUTERWORLD FOCUS.

FIRST NAME M.I. LAST NAME

TITLE

COMPANY

ADDRESS

CITY STATE ZIP

Address shown: ☐ Home ☐ Business

For faster service call 1-800-255-6286! In NJ call 1-800-322-6286.

Canada, Central America & South America $110/Europe $165. All other countries $245 (Airmail)
Foreign orders must be prepaid in U.S. dollars.

Please complete the information to the right to qualify for this special rate.

COMPUTERWORLD

1 BUSINESS INDUSTRY (Circle one)
10. Manufacturer (other than computer)
20. Finance/Insurance/Real Estate
30. Medicine/Law/Education
40. Wholesale/Retail/Trade
50. Business Service (except DP)
60. Government — State/Federal/Local
33. Communications Systems/Public Utilities/Transportation
70. Mining/Construction/Petroleum/Refining/Agric.
80. Manufacturer of Computers, Computer-Related Systems or Peripherals
35. Computer & DP Services, including Software/Service Bureau/Time Sharing/Consulting
36. Computer/Peripheral Dealer/Distributor/Retailer
75. User, Other _____
99. Vendor, Other _____
(Please specify)

2 TITLE FUNCTION (Circle one)
IS/MIS/DP MANAGEMENT
19. Vice President, Asst. VP
31. Dir., Mgr., Supvr., IS/MIS/DP Services
22. Dir., Mgr., Supvr., of Operations, Planning, Adm. Services
23. Dir., Mgr., Supvr., Analyst, of Systems
31. Dir., Mgr., Supvr., of Programming
32. Programmer, Methods Analyst
28. Dir., Mgr., Supvr., QA/WP
38. Data Comm., Network Systems Mgr.
OTHER COMPANY MANAGEMENT
11. President, Owner/Partner, General Mgr.
13. Vice President/Asst. VP
13. Treasurer, Controller, Financial Officer
41. Engineering, Scientific, R&D, Tech. Mgr.
51. Sales/Mktg. Mgr.
OTHER PROFESSIONALS
38. Consulting Mgr.
70. Medical, Legal, Accounting Mgr.
80. Educators, Journalists, Librarians, Students
36. Others _____
(Please specify)

3 COMPUTER INVOLVEMENT (Circle all that apply) Types of equipment with which you are personally involved either as a user, vendor, or consultant
A. Mainframes/Supermini
B. Minicomputers/Small Business Computers
C. Microcomputers/Desktops
D. Communications Systems
E. Office Automation Systems
F. No Computer Involvement

348617-6

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS PERMIT NO 55 NEPTUNE, NJ 07754

POSTAGE WILL BE PAID BY ADDRESSEE

COMPUTERWORLD
CIRCULATION DEPARTMENT
P.O. Box 1565
Neptune, NJ 07754-9916

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS PERMIT NO 55 NEPTUNE, NJ 07754

POSTAGE WILL BE PAID BY ADDRESSEE

COMPUTERWORLD
CIRCULATION DEPARTMENT
P.O. Box 1565
Neptune, NJ 07754-9916

Jenkins was disinclined to share his copy of Computerworld with his colleagues.

And we don't blame him. With news and information so vital to his work, he wants to hang on to his copy.

That's why you need your own subscription to COMPUTERWORLD.

Find out what you need to know. When you need to know it.

You'll see what products breakthrough. And what products break down. You'll get the news and views of the industry. And the ads and advice of its leaders.

In fact, with COMPUTERWORLD on top of your desk, you'll be on top of your job.

And there's more...

In addition to your 51 issues of COMPUTERWORLD, you'll get — absolutely FREE...

12 issues of COMPUTERWORLD FOCUS — an in-depth exploration of a single critical topic each month: communications, data security, PCs, connectivity...

Our special Spotlight section. Head-to-head product comparisons with an at-a-glance ratings chart. Security products, LANs, graphics workstations ... a different product in each issue.

Call today. Or use the return envelope bound into this issue ... because not having your own COMPUTERWORLD can be dangerous to your career.

1-800-255-6286
(in NJ call 1-800-322-6286)

COMPUTERWORLD
THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

Our expertise in corporate electronic publishing is well documented.

The truth is, nearly half of the Fortune 1000™ have already started to rely on Compugraphic for their corporate publishing needs. These companies face the standard corporate publishing demands: fast throughput, multiple input sources, continual revisions—along with the need for quality.

Exactly the demands that CAPS™ was designed to meet. CAPS, the Compugraphic Automated Publishing System, is a codeless, mouse-driven system for professional electronic publishing applications.

Whatever the needs of your particular operation, our systems specialists will configure CAPS to meet your requirements. CAPS will integrate well with systems you already have or are planning in the future—Macs, PCs, word processors, CAD/CAM workstations.

A Compugraphic system comes backed with over 25 years of experience and a program of support services to protect your investment.

Compugraphic, for the complete solution.

Cg compugraphic®

For more information on CAPS, call:
1-800-U•CALL•CG

CG and Compugraphic are registered trademarks, and CAPS is a trademark, of Compugraphic Corporation.

From anarchy to architecture

Even a strict methodology can't bring real coherence to applications development like a good architecture can

BY FRED VISKOVICH

Anarchy: "Absence of any coherering principle, as a common standard or purpose."
The American Heritage Dictionary

Much of commercial application systems development is anarchy. There is no coherent unifying principle, deplorably few standards and little or no common purpose. Application systems built on a development methodology represent progress, but we need more.

Ultimately, users will move into architecture-based systems development — that is, building generic software specifications that also provide an application-specific business solution. IBM's Systems Application Architecture (SAA) reflects this transition. But most MIS shops have a long way to go before architecture is not the exception but the rule.

JUDY FILIPPO

The end result

In the most extreme case, MIS organizations responsible for mission-critical information systems do not follow a standard development method and do not use structured analysis techniques. What are the consequences?

The first and foremost consequence of development without methodology is failure. It may come at once: The project may miss its deadline, overrun its budget and destroy the careers of its participants. But it may also come slowly, lying dormant in the nerve centers of an application and then inexorably eating away at it.

Second, these systems tend to neglect the human interface. In the absence of a methodology, design is left to analysts and programmers who, understandably, tend to equate a system with its collection of jobs, programs and files.

Furthermore, without a methodological framework, even the automated side of a system is often not viewed as an organic whole. Any documentation above the program level is either perfunctory or nonexistent. The overall impact of changes to one piece of a system cannot be assessed or communicated clearly. The risk here is that the next ostensibly isolated last-minute, must-have modification will result in the collapse of the application.

A systems development methodology represents one step forward. It brings order, even if it is stolid, bureaucratic order. At minimum, it provides an administrative framework in which some form of project management can be performed.

Methodologies also possess a good logical inventory of proven work steps, described in terms of phases, activities and tasks. In a methodology, we know what to do. And if we are late, at least we can retrace our steps to determine why.

However, no sooner does an organization develop a methodology — any methodology —

Viskovich is a manager in the information systems group at Coopers & Lybrand in Philadelphia.

- **A frame for mission-critical systems**
- **Getting beyond 'slobware'**
- **Why you're not really *building* software**

than it begins to invent excuses for not using it. Some popular excuses are "It's too long," "It involves too much paperwork" and "It doesn't address application software packages or new technologies."

Next, the cry goes out to tailor the methodology. Some methodologies, especially those employing route mapping, can be selectively implemented, but this is not to be entrusted to the ill-advised or the reluctant.

A METHODOLOGY improves the chances of a system being implemented correctly the first time.

All in all, a methodology provides a positive, even somewhat instructive, step away from anarchy. It reduces the risk of project failure by virtue of its work breakdown structure, required documentation and management checkpoints and reviews. Through its discipline, a methodology improves the chances of a system being implemented correctly the first time and surviving any changes. However, methodologies do not vanquish anarchy.

No guarantees

For one thing, methodology-run projects are successful only to the extent that someone on the other end of the three-ring methodology binder understands something about software development. While a methodology can educate those who follow it, this effect is undependable at best. As a result, systems development still lacks the coherence gained from the shared vision of peers.

Second, methodology and its techniques meet frequently with resistance. The methodology itself is, after all, a system for creating new systems, and new systems are immediately at war with the status quo.

Most of all, a methodology dictates specific new techniques — namely, information- and process-modeling techniques. So if you are not employing structured techniques — and tools to support them — then to say you have a methodology is kind of an empty statement.

Ed Yourdon, vice-president of planning at Devry, Inc., says only about 10% of the MIS organizations in North America practice structured techniques in a disciplined fashion. By implication, methodologies that mandate their use lose as well.

Not is brick wall

However, there is a more profound reason behind the failure of methodologies and the neglect of structured techniques. The classic approach contains a flaw — one that subverts design, the most important part of system development.

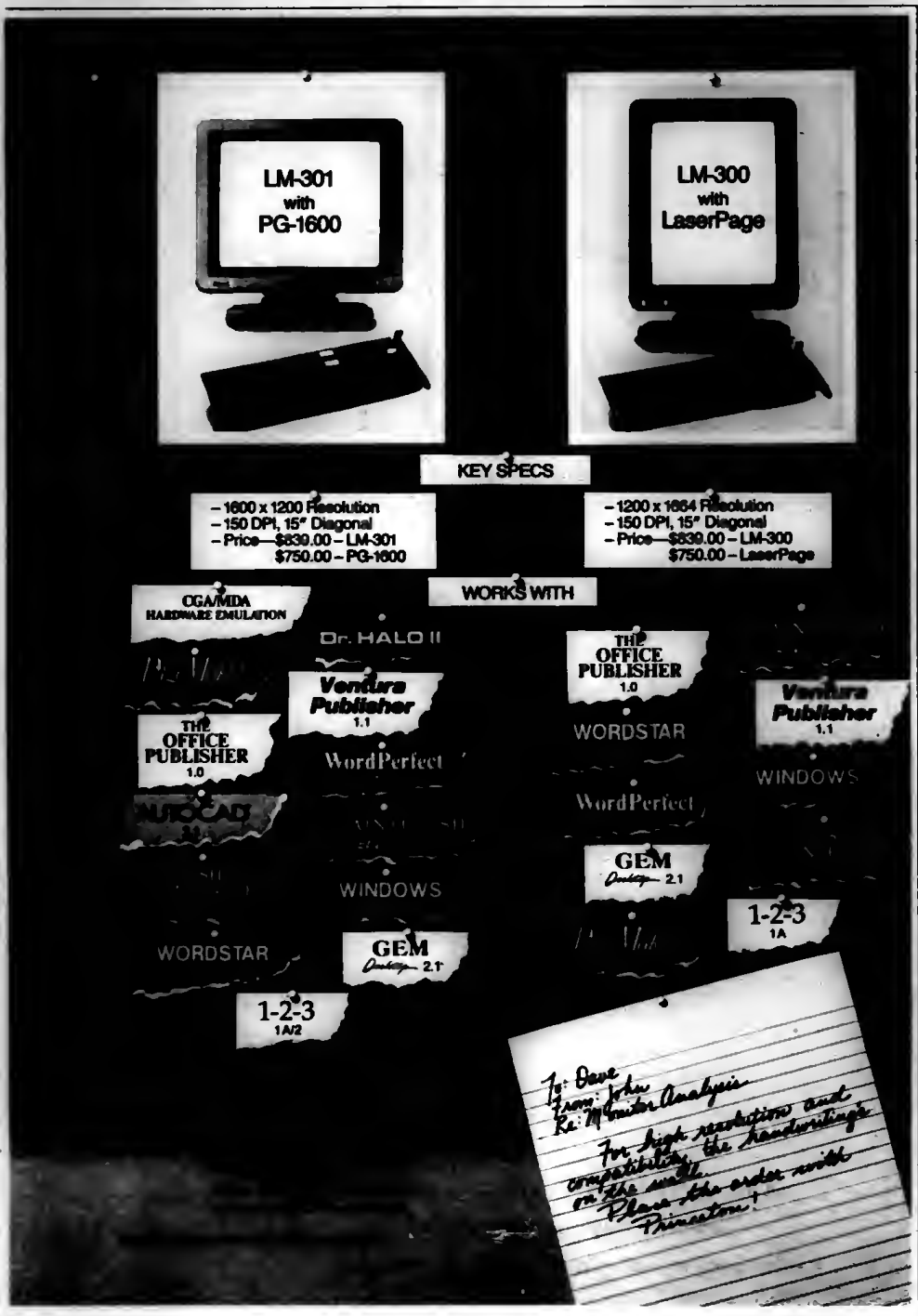
The flaw is this: All methodologies ultimately portray the systems development life cycle, including the design phase, as if it were a construction project. This is known as the construction metaphor, and it has been the Achilles' heel of systems building for the past 30 years.

What happens is that each completed task is tallied as another brick in the wall, and you can't lay the bricks for Row 8 until Rows 1 through 7 are finished. The development of the system proceeds in serial fashion, from end-user requirements at the beginning to the inevitably underestimated steps of system conversion at the end.

The metaphor fails because it attempts to describe the entire life cycle, including design, as if it were a continuous series of brick-in-the-wall activities. Construction work on a real building presumes that the architecture and engineering design stages are complete. Yet these tasks do not unfold in the same manner during system building.

The design of architecturally rich and functionally robust software does not result from collecting the products of individually complete, bottom-up analytical requirements-definition tasks. A design is not constructed from end-user requirements in a serial manner.

Requirements are the best statement of a system's goals



3Com 3+
NETWORKS CORPORATE AMERICA WITH THE POTENTIAL OF OS/2.

Today Corporate America can look forward to an era of constantly increasing productivity with the extraordinary power of IBM's OS/2.

Users of 3Com 3+ network system software can look forward to maximizing that productivity and power now. That's because 3Com 3+ is built on industry standards which make it compatible with both current network applications and future OS/2 workstation and server applications.

OS/2. It will revolutionize the productivity of Corporate America.

3Com 3+ purchased today is the safest and smartest investment you can make in network system software.

3Com 3+ productivity is being increased even more by Microsoft's OS/2 LAN Manager—the networking environment of OS/2 which is under co-development by Microsoft and 3Com.

That means that users of 3Com 3+ can enjoy the benefits of running OS/2 on their networks today, while they protect their system investment & guarantee maximum network productivity in the future.

So as Corporate America embraces OS/2...

Remember one simple fact.

3Com 3+ network system software allows you to use the potential and power of OS/2 throughout your network now.

3Com 3+. Destined to become the gold standard for OS/2 networking.

While allowing you to optimize OS/2 workstation and server applications in the future.

It's just one more reason why 3Com 3+ network system software has become a Corporate America standard.

For your nearest 3Com dealer, call 1-800-NET-3Com.

PC MAGAZINE EDITOR'S CHOICE

3Com®

©1987 3Com Corporation. 3Com and 3+ are registered trademarks of 3Com Corporation. Microsoft is a registered trademark of Microsoft Corporation. IBM is a registered trademark and OS/2 is a trademark of International Business Machines Corporation.

and objectives and the best measure of application success, but they are technically ambiguous, incomplete, fluid and — in essence — the wrong source for determining the best way to adapt available technology for competitive advantage.

What is design?

The degree to which a business can plan to locate computations, decisions and deductions on the machine side of automation can be determined only if its managers know the constraints of the technology. It is these constraints that define system design.

Knowing these constraints means settling on a standard set of design problems — data base design, display station presentation protocol and program-to-program communications — and recognizing the forces that have to be overcome to achieve their solution.

In addition, these constraints are a direct function of the state of the art in information technology and are constant across all industries. The problem of a major metropolitan hospital getting rapid access to a data base of patients is, at its root, the same problem as that of the manufacturing concern wishing to query a parts-inventory data base.

When possible, these constraints need to be expressed empirically in a "constraint metric," because they will materially affect alternative performance profiles and project costing. But a constraint can also be, for example, whether or not an SQL-style relational data base is available on a particular processor.

Nip it in the bud

To accelerate systems development, it is important to identify and analyze constraints as soon as possible, because these will dictate the design. At the beginning of the systems development life cycle, classical internal design and end-user requirements should proceed in parallel — not in tandem — to accelerate applications development, reduce cost and improve quality.

This deserialization is what compels developers to prototype. (As Yourdon points out, this is also why they abjure structured analysis.) It causes developers to recognize that one can and should address technical design issues immediately. Prototyping helps express end-user requirements, bleeding them out through the joint observation of system behavior by end users and developers.

In fact, first-cut user requirements can be transformed by exposing them to a sample implementation of relevant information technology. And prototypes can actually disclose competitive opportunities that may have strategic significance for the enterprise.

Design focuses on capturing a solution in the form of standard engineering design problems.

PROTOTYPES can actually disclose competitive opportunities that may have strategic significance.

The application's blueprint is incrementally completed through the successive refinement of an evolving specification model or prototype. Design proceeds through interaction among the designer, the system owner, end users and the technical team that will finally implement the system. It is not the process portrayed in the construction metaphor.

The resulting design is a generic set of software specifications. The designer who prescribes these is defining an architecture and, thus, is referred to as an architect. It follows that "architecture" refers to generic software specifications that provide a unique, application-specific solution by solving a relevant set of standard MIS design problems.

This definition closely parallels the more conventional meaning of architecture: the art of building. Here, human requirements and construction constraints are brought together. The solution is both practical and aesthetic, thus differing

More than
50% of
all business
PCs don't
communicate.

UN

from the pure utility of engineering construction.

At the outset of the systems development life cycle, the architecture should relate human requirements with the application software and these two with the corporate landscape. The process involves both engineering and aesthetics.

The user interface explains the success of software forms such as the Apple Computer, Inc. Macintosh and Microsoft Corp.'s Windows. Conversely, "slobware" produced without attention to user interface design can repel end users.

Early knowledge

Another example is SAA, which outlines a presentation management interface that is both standard and attractive. It stipulates common user access by specifying software constraints in application design.

SAA permits the systems architect to bring knowledge about the technology's constraints to his first meeting with a client. Identifying these constraints so early enables systems architects to create tremendously advanced second-generation systems within a framework that is clearly defined.

However, there are important differences between what the conventional and the information systems architect can do. Unlike building construction, in which the architect cannot convert plans into the actual building, computer-aided software engineering (CASE) tools permit the simultaneous design, engineering and building of a system. The prototype or specification model can be created during design and literally converted into actual code.

Using CASE to create a system describes a metaphor that is more like writing a book or creating a symphony than "constructing something." CASE closely resembles the actual process an architect follows when devising a building. It is a human undertaking that combines both analytical and intuitive talents.

Bring in the artist

If this sounds like it is making systems design into an art form, it's not. Architecture, as defined above, involves the practical, not the theoretical; there is no architecture without function.

MANY systems projects would be a lot better off under the direction of a successful Broadway choreographer than a methodless, confused DP designer.

Nevertheless, art forms are often accompanied by a prodigious amount of formal technique and painstaking attention to both practice and execution. Many systems projects would be a lot better off under the direction of a successful Broadway choreographer than a methodless, confused DP designer.

The division of labor sought by disciples of methodology should be rethought. Architecture is not the work of the newcomer. It demands broad vision, experience and formal training. Translated, architects will, in the future, dominate application systems development and will leverage their talents through paraprofessionals and apprentices. Information systems organizations and consultancies that rely on the construction metaphor will continue to fail at an increasing rate.

This failure will precipitate demand for the professional training, testing, certification and licensing of architects and designers. It will spur the overall professionalization of MIS practitioners.

The problem with systems development is not that programming is still an art and not a science. Artistic projects have been commissioned for centuries, producing impressive results that are on time and within budget. Science has not always been so punctual.

The problem lies in the anarchy of applications development. Its solution will come with the institutionalization of solid architectural and software engineering principles in the information systems industry. ●

Which just goes to show how simply you can gain an advantage over your competitors.

Get your PCs talking to each other, to departmental systems even mainframes, and suddenly your company is the one with the right information in the right place at the right time.

With Unisys, it's easy. We've got the connections to IBM, DEC and other systems.

Networks to powerful operating environments like MS-DOS, UNIX, XENIX and OS/2. Open doors to industry standards, including OSI and X400.

Plus, Unisys fourth-generation language software for your workstations and mainframes. It gets you closer to real information and enhances communications. So the best minds in your company can work together

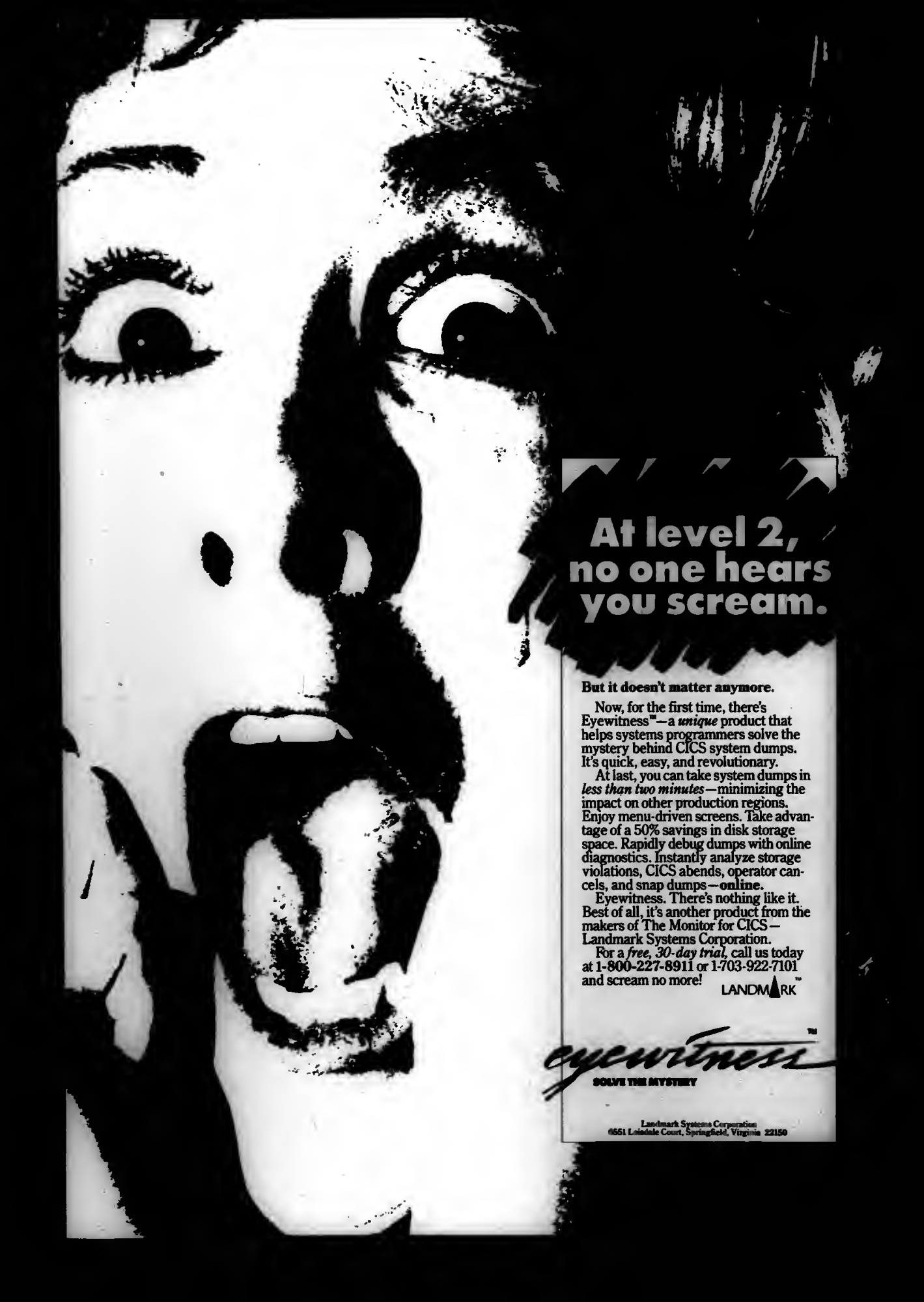
[illegible] facts and insight instead of hunches.

Unisys, a ten billion dollar computer company, believes better information leads to better decisions. And the easier your access to the right information, the better your decisions will be.

BETTER INFORMATION
BETTER DECISIONS

i SYS

The power of 2



At level 2, no one hears you scream.

But it doesn't matter anymore.

Now, for the first time, there's Eyewitness™—a *unique* product that helps systems programmers solve the mystery behind CICS system dumps. It's quick, easy, and revolutionary.

At last, you can take system dumps in *less than two minutes*—minimizing the impact on other production regions. Enjoy menu-driven screens. Take advantage of a 50% savings in disk storage space. Rapidly debug dumps with online diagnostics. Instantly analyze storage violations, CICS abends, operator cancels, and snap dumps—**online.**

Eyewitness. There's nothing like it. Best of all, it's another product from the makers of The Monitor for CICS—Landmark Systems Corporation.

For a *free, 30-day trial,* call us today at 1-800-227-8911 or 1-703-922-7101 and scream no more!

LANDMARK™

eyewitness™

SOLVE THE MYSTERY

Landmark Systems Corporation
6551 Loisdale Court, Springfield, Virginia 22150

MANAGEMENT

TAKING CHARGE

Anthony Reed

Honest, it's only aspirin

For the first time in several years, I was looking for employment.

I received an offer while I was bedridden with the flu. I phoned the next day to accept the offer. I was told that a pre-employment physical, within 72 hours after acceptance, was mandatory. Between my nose-blowing and throat-clearing, I explained the seriousness of my condition but was told that unless I appeared within the time period, the offer would be rescinded.

The next day, I dragged myself out of bed and drove to the doctor's office — despite the warning labels about driving while under medication. My blood pressure and pulse were high. My chest was congested. Breathing was difficult. I was dehydrated. I almost passed out from the aspirin and flu, throat, cold and muscle-ache medicines.

Only the multivitamins kept me awake. My system held every legal over-the-counter medication known to mankind.

After having me touch my toes to test my flexibility — I guess they wanted to be sure I could pick up printouts from the floor without bending my knees — the doctor gave me a paper to sign. They wanted me to take a urine drug test! Needless to say, I was surprised. Now I knew what it's like to be guilty until proven innocent: I was so full of medication that my urine probably glowed in the dark.

Continued on page 82

Pros, users air woes: each other

MIS, users agree they need to talk more, but there the consensus ends

BY ALAN ALPER
CW STAFF

NEW YORK — Allow two demanding MIS professionals to discuss the state of data processing with two savvy heads of end-user organizations, and the conversation soon resembles a congressional debate split along party lines: Both sides agree that they disagree because of ideological differences.

That's what emerged from a spirited panel discussion on end user-MIS relations — simulating such relations in a typical company — at The Conference Board's sixth annual conference on information management, held here last week. Both sides agreed that there is not enough communication and coordination on the strategic use of information technology. Beyond that, there was little else they agreed on.

The MIS management representatives contended that end users are unable to state their DP requirements, are unwilling to take ownership of projects, shy away from cost-justification questions and do not understand technology.

The end-user camp countered that even when they can state their requirements, MIS is unable to deliver usable systems in a timely fashion, is unwilling to let them play an equal role in project management, is incapable of providing accurate expense assessments and spouts jargon when plain English would suffice.

"The problem is, [MIS] is always trying to get us to put our square pegs in their round holes," noted John Kelly, executive director of human resources at Tenneco, Inc., who represented end users.

"They don't seem to under-

Continued on page 80

Integration fuels rising service need

BY JAMES CONNOLLY
CW STAFF

MOUNTAIN VIEW, Calif. — Demand for professional services in large-scale computing organizations — fueled in part by the growing use of systems integrators in the commercial world — will soar at an average annual growth rate of 18% between now and 1992, according to a recent study.

Users of large-scale systems are looking outside with increasing frequency for systems integration services and contract services such as software development, facilities management, consulting, education and training, according to research company Input, based here.

Input found that the applications backlog in most organizations is not being reduced and that major resources are needed to maintain existing systems. The company said internal staffs tend to have limited skill sets and experience, so outside services become more appealing.

The study predicted that the professional services market will grow from $14.6 billion in 1987 to $33.9 billion in 1992.

Key growth areas are expected to be systems integration and, within contract services, software development.

Input noted that while the federal government is already a heavy user of systems integration services, spending $2.3 bil-

Continued on page 85

Boom years

Systems integration projected to outgain other professional services by averaging 30% growth per year

INFORMATION PROVIDED BY INPUT

Laser disk rates high in training

BY ALAN J. RYAN
CW STAFF

MIS organizations that are struggling with the escalating costs of training may have a solution in their own backyard.

Interactive laser disk technology is coming on as a cheaper and more flexible alternative to the labor-intensive process of classroom training. And recent research by a manager who sought to quantify the results of such laser disk-based training indicates that users actually retain information better when they learn it from the interactive medium.

According to Mahmoud Elsayess, manager for data base systems services at Hughes Space & Communications Group in Los Angeles, laser disk training combines sight, sound and hands-on contact in a format that lets the student proceed at his own pace. Elsayess predicted that within two or three years laser disk technology will be a major force in most industries.

Flying high

The technology is already in use in such varied settings as the U.S. Air Force, which employs some laser disk technology to train its pilots, and hospitals, which teach emergency-room personnel how to deal with stab-wound victims.

Elsayess said users trained with this method retain 25% to 45% more than those taught using traditional methods. The key is flexibility. In a classroom setting, some teachers might be too slow for some students, too

Continued on page 80

VENIX Shatters UNIX® Performance Myths

MYTH 1: **No UNIX® can handle time-critical applications**
FACT: **VENIX Does**

VENIX handles time-critical applications which leave weaker UNIX Operating Systems crumbling. These are the same applications which you confront daily. Graphics generation and database manipulation. MRP and OLTP. Simulation and process control. No other implementation even comes close. VENIX extensions include file write through, direct hardware access capabilities, concurrent or asynchronous I/O, and preemptive priorities to significantly improve performance and productivity. Others claim it, VenturCom guarantees it.

MYTH 2: **XENIX is the UNIX for PCs**
FACT: **VENIX is the better choice**

VENIX offers unequalled performance and guaranteed response. VENIX operates for weeks without a crash under heavy loads. And, VENIX comes with the best support in the industry, VenturCom support. VENIX is the only System V implementation with real-time extensions which is SVID compliant and SVVS certified. VENIX is the only real-time implementation of UNIX for Intel® 80286™ and 80386™ processors.

Discover what your customers — and your competition — already know. Call and we will give you even more reasons to choose VENIX.

VENIX, the 386 UNIX of choice

VenturCom
EXCELLENCE REALIZED

215 First Street Cambridge, Massachusetts 02142 (617) 661-1230

VENIX is a trademark of VenturCom, Incorporated • XENIX is a registered trademark of Microsoft Corporation • Intel is a registered trademark of Intel Corporation • UNIX is a registered trademark of AT&T • 286™ and 386™ are trademarks of Intel Corporation

Airing woes

CONTINUED FROM PAGE 79

stand that they have to serve the customer — the end user," added Robert Lockerd, vice-president of Texas Instruments, Inc.'s Defense Systems & Electronics Group, who also represented end users. "You can't transform [the end-user] to deal on MIS's terms."

J'accuse

Each side pointed accusatory fingers at the other about systems development backlogs. Development delays occur because end-user departments rarely reach a consensus on what they want, asserted Raymond Perry, Avon Products, Inc.'s vice-president of information services, who represented MIS management.

"We spend 50% of [the development] cycle time acting as an arbitrator helping [end-user] staffs decide what they want," he maintained.

"Sure, our requirements change, but we still haven't gotten the systems we asked for, either," TI's Lockerd shot back.

Development cycles and budgets get stretched because end users prefer custom-developed applications when less expensive packaged software will do, Perry said. "Users will say, 'This package is not good for us; we're not like the thousands of other companies using it,' " he added.

John Diesem, senior manager and director of financial services strategic systems planning at Peat, Marwick, Main & Co., who also represented MIS, stressed that end-user executives do not attempt to participate in project planning. "It's hard to get them to participate in steering committee meetings," he asserted.

End users charged that while MIS claims to want end users to participate in systems development, many DP managers are fearful of losing control over the projects they have nurtured. And when end users are invited to planning sessions, they said, they feel as if they've participated in a United Nations General Assembly meeting without a translator.

"Nothing is worse than hearing technology terms bandied about and knowing that MIS is waiting for you to ask what it means so you look inferior," Tenneco's Kelly noted.

Avon's Perry pleaded guilty to feeling threatened by end users for control of DP projects but asked that users become more knowledgeable of technology.

Cost justification caught the ire of both sides. End-user departments are squeamish about making cost-justification presentations to upper management because chargeback figures quoted by MIS always increase, Kelly said. Prices increase because of ever-changing user requirements and technology advances, Peat Marwick's Diesem countered.

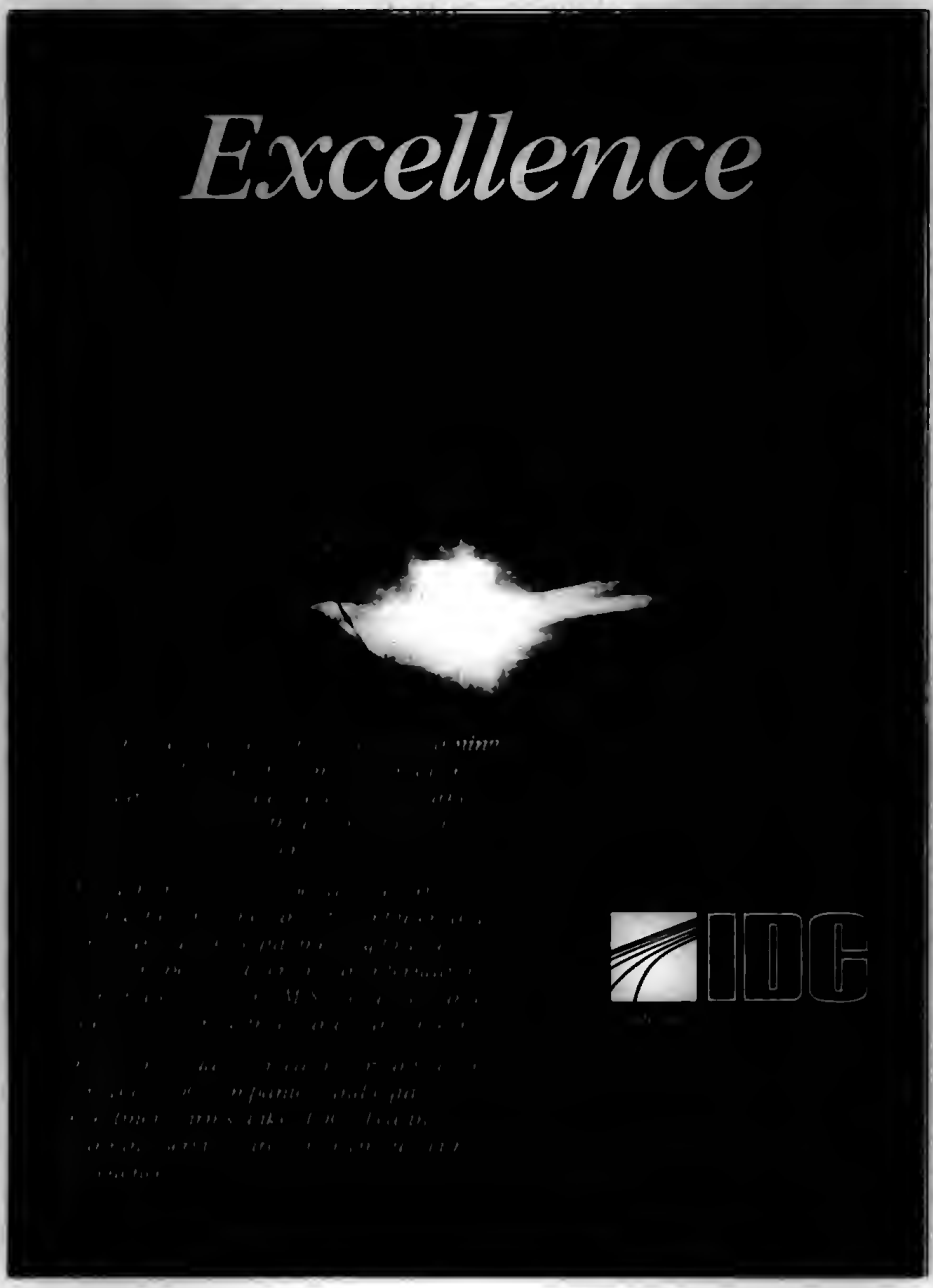
"Sure, we're careful, because we pay for it," Kelly noted. "When [MIS] blows it, the project still gets charged to us."

Talking the talk

As departmental computing becomes more accepted, end users should employ information systems professionals who speak and understand MIS lingo, Kelly said. Continued use of prototyping can also help forge better ties between end users and MIS, be added.

"The question of requirement definition is critical," Kelly acknowledged. "Users don't know what they want until they see some of it."

Overall, both sides agreed that they need to stay in close contact with each other if they hope to overcome their ideological differences. "Dialogue, not monologue, is the solution," Lockerd concluded.



Laser disk

CONTINUED FROM PAGE 79

quick for others. Furthermore, if a class size does not reach a certain number, the class could be canceled. Class hours also tend to be rigid, taking employees away from work.

With laser disk training, each student has the materials at his disposal, and no classroom or teacher is needed. "The student can learn at his own convenient time and his own pace," Elsayess said. The training is more useful because if the student makes a mistake or does not understand, he can go back to the trouble spot until he learns it.

For companies with multinational operations, bilingual training can be made available. If the student is trying to learn the course in English but fails to understand something, he can switch over to his native language on the disk.

One of the first ambitious undertakings of laser disk training is the U.S. Army's Electronic Information Delivery System project. The hardware for the project alone cost an estimated $224 million; 47,000 personal computers and laser disk players were purchased. Software costs, however, are expected to reach $1 billion.

Laser disk training could also make a dent in the coming shortage of information systems professionals, Elsayess believes. "By 1995, we need around 600,000 DP professionals. Right now, we have approximately 350,000," he says.

When DP professionals need information on IBM's MVS/XA, Cobol or other operating systems, most are taught within the department by an experienced user or sent to training school. "If there were a laser disk course for MVS/XA, you could rent it and try it," Elsayess says. "The people learning won't fall asleep, because the system asks questions, and it will tell you if you're making mistakes."

Every month more than 125,000 information systems professionals FOCUS on the issues that make a difference.

When information systems professionals want to know more about the most important and pivotal issues facing them in 1988, they choose *Computerworld Focus* for the most in-depth and complete coverage available.

Every month *Focus* goes beyond the headlines and examines one current topic with an eye for its effect on information systems today, tomorrow and beyond.

Topics like connectivity, operating systems and languages, productivity software, departmental computing, security and many more are studied and analyzed from a total systems perspective. Critical issues involving PCs, communications and software will be covered several times during 1988. All get precise, cover-to-cover treatment in *Computerworld Focus.*

And *Focus* gets cover-to-cover treatment from its readers. More than 125,000 *Computerworld* subscribers — serious information systems professionals — turn to *Focus* every month for the bigger picture of product and service information that affects their specification, purchase or implementation decisions.

Take a look at what *Focus* has planned for 1988.

Computerworld Focus 1988 Schedule

Issue Date	Closing Date	Topic	Show Distribution
Jan. 6*	Dec. 4	Communications/ Connectivity	Communication Networks
Feb. 3	Dec. 31	Software Operating Systems & Languages	Uniforum
Mar. 2*	Jan. 29	Departmental Computing	Interface/ WCC
Apr. 6	Mar. 4	Data Security	
May 4	Apr. 1	Communications/ Connectivity	Comdex Spring/ ICA
June 1*	Apr. 29	PC End User Productivity	PC Expo
July 6	June 3	Software	
Aug. 3	July 1	Departmental Computing	
Sept. 7	Aug. 5	Communications	TCA
Oct. 5	Sept. 2	Software Productivity	Info '88/ Dexpo West
Nov. 2	Sept. 30	PC/Connectivity	Comdex Fall
Dec. 7	Nov. 4	Departmental Computing	

* Starch Ad Study Issue

Computerworld Focus. For the more than 125,000 information systems professionals who need to know not just *what's* happening — but also *why* and *what it will mean.* For information on advertising, contact your local *Computerworld* sales representative.

COMPUTERWORLD

An IDG

COMPUTERWORLD FOCUS

Micro strategies unfold

Reed

FROM PAGE 79

But no urine test, no job.

Taking this test wasn't as simple as it sounds. I had to list all of the medication that I had taken during the past two weeks. (I merely referred them to Aisle Three of the drugstore.) Then I was escorted to a small restroom. As I began to close the door, the doctor informed me that he had to watch. I guess the drug-free urine vendors have really had an impact on the testing procedures. Now I knew how my 3-year-old son feels when I take him to the restroom, only with the pressure of realising that a $30,000 to $40,000 job depends on it.

Then I had to wait a week for the results.

The hardest part

The week seemed like a year. I began to wonder what would happen if I failed the test. Would the company label me a junkie? Would insurance companies or other companies ask me if I'd ever failed a drug test, and then reject me if I said yes? Would another employer learn through the grapevine that I might have failed a drug test? What would happen if the testing lab got my sample mixed up? What would've happened if I'd attended a rock concert the night before and had sat near someone smoking a "hand-rolled Colombian special"? Or if I'd been on the West Coast when the air-pollution detectors picked up the heavy concentration of marijuana during the pollen season?

THE WEEK seemed like a year. I began to wonder what would happen if I failed the drug test.

By the time the results arrived, I was at my wit's end. I began to wonder about the credibility of the drug lab that processed the sample. Put yourself in its place for a second. You realize that if you misread or mixed up the samples, you might find yourself in a lawsuit. So what would happen if you threw the samples away and indicated that everyone passed the tests? Everyone is happy. The company believes it will get a drug-free employee. The employee gets a job. And you don't have to worry about legal fees or increased insurance rates. If it's later discovered that the employee is a junkie, you merely indicate that that was the 1% error that's normal for your industry. This made me wonder how many firms "test" the drug labs to be sure they're really doing their job?

If you're curious about the test results, so am I. I sent the unopened letter back to the company and rejected its offer. I found out that it didn't have a no-smoking policy.

Reed is director of business systems at a Dallas-area institution.

HIGH CAPACITY
ALUMINUM
3480 Cartridge Cases

5031

5032

HEAVY DUTY - COMPACT

Model No.	Capacity
5030	1 to 20 Cartridges, removable tray included, 13 × 9½ × 5¾
5031	1 to 40 Cartridges, 2 removable trays included, 19 × 13 × 5¾
5032	1 to 80 Cartridges, 4 removable trays included, 19 × 12¾ × 12¾

All above units include removable 20 capacity ALUMINUM trays

5106	1 - "20 Pack" Plastic Tray (tray not included) 16 × 12¾ × 6
5107	2 - "20 Pack" Plastic Trays (trays not included) 25 × 14 × 7

See your local dealer, or call/write — DIVISION OF BY-LO MFG., INC.
ALUMINUM CASE CO.
3333 W. 48th Pl. • Chicago, Illinois 60632 (312) 247-4611

SLIP YOUR DISKS TO ICELAND.

Exporting computer technology to Iceland shouldn't seem so slippery. Exporting means business. Increased sales for video cards, diskettes, word processors, index systems and more, all over the world. Call U.S. and Foreign Commercial Service now. 1-800-343-4300* Operator 199.

*In Alaska call 1-800-555-1000

CALENDAR

MAY 1-7

BLIS/Cobol Users Group. Clearwater Beach, Fla., May 1-4 — Contact: BLIS/Cobol Users Group, P.O. Box 2156, Altamonte Springs, Fla. 32715.

ICI 1988 Annual Conference, Management of Change and Innovation Supporting the Explosion of End-User Computing. Dallas, May 1-4 — Contact: Information Center Institute, 3230 Commander Drive, Carrollton, Texas 75006.

International Association of Synercom Users Conference. Houston, May 1-4 — Contact: Gary K. Carnes, P.O. Box 1329, Sugar Land, Texas 77487.

Spring Conference on Disaster Recovery and Computer Security. Marco Island, Fla., May 1-4 — Contact: Harris Devlin Associates, Corporate Offices, 2715 Tuller Parkway Drive, Dublin, Ohio 43017.

International Symposium on Information Resources Management. Toronto, May 1-5 — Contact: Business Forms Management Association, Inc., Suite 712, 519 S.W. Third Ave., Portland, Ore. 97204.

The Elusive Payoff in Information Technology Conferences. New York, May 2-3 — Contact: Aida Rivera, Business Week Executive Programs, 1221 Avenue of the Americas, Suite 4049, New York, N.Y. 10020.

Guidelines Macintosh Forum '88. Chicago, May 2-3 — Contact: Guidelines — Mac Forum '88, Box 456, Orinda, Calif. 94563.

DBMS User Group Meeting. Chicago, May 2-4 — Contact: Beverley Van Kirk, Conference Coordinator, DBMS, Inc., 600 Olympian Office Center, 4343 Commerce Court, Lisle, Ill. 60532.

Eastern Communications Forum88. Rye Brook, N.Y., May 2-4 — Contact: Eastern Communications Forum88, Suite 4808, 505 N. Lake Shore Drive, Chicago, Ill. 60611.

Westinghouse Nuclear User Group Meeting. Pittsburgh, May 2-4 — Contact: Westinghouse Electric Corp. Management Systems Software, P.O. Box 2728, Pittsburgh, Pa. 15230.

A/E/C SYSTEMS '88. Chicago, May 2-5 — Contact: Sharon Price, A/E/C Systems '88, P.O. Box 11318, Newington, Conn. 06111.

Autocad Expo '88, For the Drafting and Design Professional. Chicago, May 3-5 — Contact: Autodesk, Inc., 2320 Marinship Way, Sausalito, Calif. 94965.

International Forum for Air Cargo, Air Cargo Tomorrow — Intermodal, Automated, Database. Miami Beach, May 3-5 — Contact: Society of Automotive Engineers, 400 Commonwealth Drive, Warrendale, Pa. 15096.

Looking for computer training services?

MARKETPLACE puts you on the right track.

COMPUTERWORLD MARKETPLACE

Shop for the products and services you need. Every week.

Need to rent or lease computer equipment?

Find what you're looking for with the *leased* amount of effort — in MARKETPLACE.

COMPUTERWORLD MARKETPLACE

Shop for the products and services you need. Every week.

SPRING TRAINING

FOR DEC USERS

Managing Your DEC Systems. It's No Game. You demand peak productivity from your DEC equipment. You need special training to get it. That training starts with DEXPO Spring 88. See applications and enhancements for your MicroVAX* or VAX* system. For DEC PCs, PDP-11s* — and more. Find integration products that link all your systems. Connect to PCs, Macs, mainframes, supercomputers and workstations. Compare 10,000 DEC-computing innovations. Over 200 vendors help you find the best solutions for your DEC system needs. And it takes only one solution to improve productivity.

Cover All the Bases ... Attend DECUS* *and* DEXPO. *DECUS Spring Symposia attendees are admitted to DEXPO Spring FREE.* Attend both. It's the best way to evaluate new technologies. Learn new techniques. Take advantage of show savings. And sharpen your competitive edge. For serious DEC users, it's more than spring training. It's a grand slam! **Free Show Preview & V.I.P. Tickets.** Call **800-628-8185.** We'll send you a FREE Preview of over 100 DEC computing products. We'll also send money-saving V.I.P. tickets. (DECUS is not affiliated with DEXPO and requires separate registration.)

FREE Show Admission for DECUS Attendees!

REGISTER TOLL-FREE AT 800-628-8185

Organized by Expoconsul International, Inc., 3 Independence Way, Princeton, NJ 08540

*Registered trademark of Digital Equipment Corporation. DECUS is not sponsored by or affiliated with DEXPO. Macintosh is a trademark of Apple Computer Inc.

DEXPO®
Spring 88

THE 15TH NATIONAL DEC*-COMPATIBLE EXPOSITION

Cincinnati Gardens
Cincinnati, Ohio
May 17-19, 1988

Banking

CONTINUED FROM PAGE 1

on the first automated teller machine (ATM), filled his bank's coffers by offering DP services to a variety of non-banking entities and led pioneering, but ultimately failed, efforts into videotex-based home banking and point-of-sale (POS) data capture. He has recently helped drive a unique collaboration between Electronic Data Systems Corp., Norwest Corp. and Banc One to create an integrated banking software product for sale to the industry.

Fisher is considered a visionary in the industry. "He's a pioneer," says Don Long, a financial services industry consultant at IBM. "He understands how technology can make things more efficient to better serve the customer, and that's the real name of the game."

"He knew that using [DP] systems was 'mission-critical' long before the cute phrases were in vogue," adds David Gilbert, president of Banking Decision Systems in Waltham, Mass.

"We've debated for countless hours whether he is too far out front," says Jim Brewer, executive vice-president at Wachovia Bank & Trust Co. in Winston-Salem, N.C., and a longtime associate of Fisher's. "Time has proven that he is way ahead of his time on ideas like POS terminals. But even with things that he's too far out front on, he still stretches minds better than anyone in the industry."

Adding it up

The numbers tell the story: In Fisher's tenure, Banc One — a name Fisher created to polish up City National's image — grew into the third most profitable bank holding company in the U.S. Operating in five states, soon to be six, Banc One now ranks 28th in the country, boasting $23 billion in assets with 61 banks, 18,000 employees and profits of $231 million in 1987. The DP organization, now a separate unit called Banc One Services Corp., has more than 4,000 employees.

"The bank wouldn't be where it is today without Johnny Fisher," states John G. McCoy, the retired president of Banc One who oversaw Fisher's sometimes wacky, mostly brilliant maneuvers for 22 years before retiring in 1982.

"Banking is boring," Fisher says simply. "You have to constantly work on something new, something that will stimulate you. Too much of banking is working on yesterday's projects."

Fisher was no banker, nor was he a technologist when he came to Banc One after a nine-year stint as a disc jockey and ad man at a tiny radio station in Newark, Ohio. But he somehow envisioned, within the staid world of banking, that technology could drive a little bank into the big time. It would just take some creativity, innovative use of the data processing department and a bank management willing to let him have his way.

McCoy told Fisher upon hiring him, "I don't want you to ever learn how to open an account or make a loan. We've got 20 guys to do that. I want you to always be thinking about what the customer wants." Fisher credits McCoy as that perfect boss: always willing to say, "Let's try it," but with the unspoken caveat, "It better work."

Indeed, McCoy was more than a trusting benefactor. A legendary figure in his own right in banking circles, McCoy's reign as chairman of Banc One was characterized by his belief that a bank must serve its stockholders, employees and customers equally in order to prosper.

He trusted Fisher to find and expand markets, and he consistently backed his unorthodox protege against the bank's conservative board. When Fisher left the bank in the early 1970s to try his hand at another job in the financial industry, McCoy was disappointed but wished him well. Two years later, Fisher called asking to return; the new job was simply not stimulating.

McCoy told Fisher that he never should have left but welcomed him back in the position of vice-president of research. "The trouble was that Johnny had to answer to the board of directors at his new job, and he can't work with people telling him what to do."

McCoy viewed Fisher as a creative artist. "You can't tell them how to express themselves," McCoy says. "And the key to our relationship was I was dumb enough not to try to tell him how to do it."

Led by McCoy, the bank had in 1966 convinced giant Bank of America in San Francisco to take its Bankamericard credit card out on a national basis. Banc One would act as the interchange bank, handling all the back-room DP activities to make Bankamericard — subsequently renamed Visa — the first nationally accepted credit card. This innovative maneuver not only poured revenue and credibility into Banc One but helped change Americans' buying and spending habits. The age of plastic had begun.

Fisher saw the infinite possibilities the credit card could provide. But he also had to oversee the back-room innovation for the bank. He worked closely with the DP department to invent the processes necessary to handle this massive accounting problem. This need precipitated the requirement for on-line capabilities, so Banc One put up the first NCR Corp. card random-access memory, or CRAM, on-line authorization services.

Fisher was not intimidated by technology. "Back in the '60s and early '70s, DP was not nearly as complex as it is today," he says. "You could quickly learn the language, so it was no time at all before I could talk to them and they could talk to me. And that marriage of technology and

marketing allowed us to move rapidly out across Ohio."

The early entry into the credit card business gave Banc One a strategic advantage it has never relinquished. "Because you are early in a marketplace, you have an opportunity to exploit the capability. It's given us a unique earnings opportunity for 25 years," Fisher says.

This early embrace of technology provided another, unexpected benefit. "We quickly began to build some notoriety around this unique product," Fisher explains. "We found bright young people coming out of college and DP people in other banks who said, 'Hey, that's the kind of organization I want to work for.' "

Once the bank had its DP foundation in place for servicing the credit cards, Fisher found the potential for enhancements unlimited. He quickly tied the credit card together with the checking account, providing an early example of overdraft protection.

By 1969, working with Polaroid Corp., he had introduced the first full-color picture credit card. That same year, Fisher initiated the 24-hour banking machine for use with a Bankamericard. It was the forerunner of the ATM, which Fisher also shepherded into existence two years later, working closely with Docutel.

Driving the bank's burgeoning interest in electronic delivery systems, Fisher pushed into other arenas. In 1977, Merrill Lynch & Co. turned to Banc One to help initiate its Cash Management Account program, an unprecedented step into electronic funds transfer capability for brokerage houses. That success attracted other brokers, and Banc One developed a significant business in processing central asset accounts for brokerages.

"If Merrill Lynch can issue credit cards, why not others?" Fisher asked. He approached the national association of credit unions in Madison, Wis., and today has 1,500 credit unions across the country using Banc One to process its credit cards. This year, Banc One will announce a similar deal with the American Association of Retired Persons in Washington, a 27-million-member organization.

Fisher's forays into technology were not always smooth or successful. He clashed with the DP organization, which ran a strong IBM shop, when he insisted on bringing in Tandem Computers, Inc. machines for handling the nascent ATM network. The Tandem-based ATM network was successfully implemented but has remained a separate unit within Banc One Services.

Two other Fisher-driven ideas simply didn't work. In 1971, he became a vocal proponent of POS plastic card programs in which consumers could use a single credit card to pay for groceries or any other item and have it debited directly from their checking accounts. An attempt in 1977 to establish a POS network survived for two years before Fisher concluded that profits were not forthcoming and closed it down. Customers were simply not ready to change their purchasing habits. "It was an idea whose time had not yet come, and still hasn't," he laments.

Fisher was also an early proponent of video home banking in 1979. He set up a consortium of seven large banks around the country to attempt to build a national data processing capability to deliver home banking services via videotex. Each bank kicked in $2 million in 1983 to investigate the potential. But by 1985, the seed money was gone, and another idea died at the hands of an apathetic marketplace.

Still stumping

Fisher is undaunted by failure. At 60, he has become an industry leader, speaking 100 nights per year around the country on the need for banks, rather than taking the traditional insular view, to work together to fend off competitors such as Ford Motor Co., General Motors Acceptance Corp. and Merrill Lynch, which have made giant inroads into banking's traditional markets. Banks must view the fight as banks vs. new financial service providers, not banks vs. banks, he says.

But Fisher knows he has made his mark and is contemplating retirement in two or three years. Then he will spend more time hunting and fishing in his Canadian cabin or touring the Southwest in a new motor home with his wife.

There is a last little tug, however. Banking, he believes, is finally getting exciting, and that makes it harder to leave. "I'm like an artist in that I like to finish something, number it, sign it and then stand back and look at it. I like the process, but it's the finished product that matters."

Yes.

It's a powerful new multiplexer *and* a next-generation network processor.

Designed for users having multiple locations and various connectivity requirements. For the user who must accommodate different applications, speeds, protocols and transmission media. For the user who also looks to future change and growth.

All with maximum control and minimum costs. How does the SPX™ do it?

The SPX is a new multiplexer with a highly versatile hardware engine.

The new architecture delivers larger capacity, more processing power, higher speeds, greater available bandwidth, and new standards of modularity.

It serves sites as small as eight channels or as large as 1,500 channels and 40 concentrated links. And by ordering the SPX in increments of eight channels, or four links, you never buy capacity you don't need.

Plus, it delivers channel speeds up to 19.2Kbps and link speeds up to 64Kbps.

The SPX is a sophisticated new network processor.

It connects multiple devices and sites into a single efficient network. With intelligent switching, dynamic routing, support for synchronous channels and a network management package.

It features a software driven architecture with a floppy disk drive—a foundation for change and growth in your data applications.

You benefit from lower operating and transmission costs, increased user productivity and equipment utilization, and substantial savings as your network needs change.

The SPX is a part of N.E.T.'s total solution to your multiplexer and network needs.

With the SPX, you can build a network that best meets your strategic requirements. A network of all SPXs. A network integrating N.E.T.'s most advanced wide-area Transmission Resource Managers, the IDNX® line. Or a network that incorporates N.E.T.'s entry-level networking multiplexers, the Series 2000 line.

The SPX also comes with something you won't find with competitive products: N.E.T.™ service and support.

N.E.T. specializes in building custom communication networks that best serve your application needs. And building an ongoing relationship with you, the client, to assure the continuing success of your applications.

Like to know more?

Call today for the SPX brochure or more information. 1-800-235-6935. Ask for Department M66

Our clients are winning.™

NETWORK EQUIPMENT TECHNOLOGIES

ComDesign Data Communications Group

IDNX is a registered trademark of Network Equipment Technologies, Inc., N.E.T. and SPX are trademarks of Network Equipment Technologies, Inc

Integration

CONTINUED FROM PAGE 79

lion in 1987, much of the demand for those services in the future will come from commercial systems users.

Input estimated that the commercial systems integration market will rise from $1.8 billion in 1987 to $8.9 billion in 1992, with an average annual growth rate of 38%. The firm cited a $300 million IBM contract to implement office automation systems for Ford Motor Co. as an example of how systems integration can boom.

The largest segment of the professional services market remains software development, which will grow from $7.6 billion in 1987 to $14.5 billion in 1992, Input predicted.

Input officials noted that software development's 14% average annual growth rate is deceptive because that figure does not include the software development segment of systems integration.

How to buy dBASE IV for $30.

Buy dBASE III PLUS today.

Buy the best data base program available today, dBASE III PLUS.™ Return the registration card to get your $30 upgrade certificate.* And you'll be one of the first to get dBASE IV™ this summer.

What about your dBASE III PLUS applications? Since dBASE IV is 100% compatible with dBASE III PLUS, everything you do now will work then. Only better.

ASHTON·TATE®

*Upgrade offer valid February 17 through July 31, 1988. Proof of purchase required.

Trademarks/owner: dBASE III PLUS, dBASE IV, Ashton Tate/Ashton Tate Corporation © 1988 Ashton Tate Corporation. All rights reserved.

INDUSTRY INSIGHT

Clinton Wilder

Ah, spring . . . time for lists

Spring again. Time for leading computer vendors like DEC to unveil major new products, for other leading vendors like IBM to hold annual meetings (today, in fact), and for the list makers of the U.S. business press to unveil their new products: the Fortune 500, the Forbes 500 and the Business Week 1,000.

Stacked up together, these three volumes resemble the bulk of a typical IBM systems software manual. But in perusing the lists of America's corporate biggest and brightest ranked 60 ways to Sunday, one can find some choice tidbits that point out trends among major computer vendors in the past year.

We'll take it from the top of the Fortune 500, which of course means IBM. Despite all its negative press — and stock drops — in recent months, Big Blue remains the world's most profitable corporation by a healthy $400 million over No. 2 Exxon. IBM held its spot as No. 4 on the Fortune 500 list in sales, although Mobil closed to within $3 billion in 1987. AT&T, with a slight drop in revenue in 1987, traded places with Texaco and fell to No. 8.

Joining the titans in the Fortune 50 were Unisys at No. 36, up from No. 46 and leapfrogging DEC; DEC at No. 38, up from No. 44; and Hewlett-Packard at No. 49, up two places.

IBM's net profit margin of 9.7% was only 66th on the 500 list, but Big Blue still ranked better than all but four of the top 50 companies in sales. One of those four was — you guessed it — DEC, at 12.1%, good for 34th place in the profit margin sweepstakes.

But the big winner among computer firms in this category was Cray Research, whose whopping 21.4% margin easily topped the industry and was seventh on the overall 500 list. Cray, No. 397 in sales, came in fifth overall with its 10-year annual growth rate of 48%; it also ranked fifth in total return to its investors over the same period.

Continued on page 88

Quarterly profits look healthy

Mainframes get warmer; micros stay hot; mini vendors may feel a chill

BY NELL MARGOLIS
CW STAFF

The prophets of doom and gloom were confounded by the profits of bits and bytes once again, as first-quarter earnings reports from companies across the computer industry last week continued to show overall robust health.

"Isn't that a surprise, considering what everyone was predicting?" said Laura Lederman, an analyst at Duff & Phelps Selected Utilities, Inc. in Chicago. Revenue and earnings news was upbeat for the most part, according to Lederman, who said market analysts had set the groundwork for positive reaction by pegging expectations low.

Cautious market observers were in for no rude shocks last week, as the numbers that emerged continued to evidence already noted industry trends. Financial results reflected renewed interest in mainframes, a continuing boom for leading microcomputer vendors and an impending chill in the minicomputer sector. Mini vendor Wang Laboratories, Inc. posted a disappointing 3% revenue growth but had warned analysts earlier about weakness in the quarter.

Amdahl Corp.'s a 71% surge in profits "is not necessarily indicative of a resurgence in the mainframe market," said Jeffrey Canin, an analyst with Montgomery Securities in San Francisco. "Market capture is the story here. What you're seeing is Amdahl's price/performance advantage [over IBM] on a very strong product line."

Amdahl, which reported $367.7 million in first-quarter sales, a 15% rise over last year, is poised for new mainframe announcements in the near future, said Canin, who forecast "a progressive year with comfortable gains" for the Sunnyvale, Calif., company.

MCI Communications, Inc.'s stunning 180% jump in net earnings and 18% advance in revenue justified early 1988 market observations that communications would prove a strong industry niche in the coming year.

Other companies reporting results last week included:

Apple Computer, Inc. The Macintosh maker's second fiscal

Continued on page 89

1988 first-quarter earnings

Vendors of mainframes and micro products boom, but business slows at Wang, Altos, VM Software and Storage Technology

Altos Computer Systems	$0.6	(71)	$42.8	6
Amdahl	$43.2	71	$367.7	15
Apple	$79.7	136	$667.2	51
Electronic Data Systems	$89.1	38	$1.12B	8
Harris	$24.7	13	$534.7	0
Lotus	$18.3	34	$117.3	36
MCI Communications	$40	180	$1.13B	18
Microsoft	$37.3	95	$161.0	65
NCR	$74.1	20	$1.36B	14
Regent Computer Systems	$1.1	33	$14.2	69
Storage Technology	$9.6	(11)	$186.3	7
Tandy	$44.1	27	$689.1	8
VM Software	$0.6	(22)	$6	27
Wang	$22.7	265	$767.9	3

¹ Parentheses indicate decrease

CW CHART

IBM puts Metaphor on the map

BY KATHY CHIN LEONG
CW STAFF

MOUNTAIN VIEW, Calif. — IBM announced last week that it has invested approximately $15 million in Metaphor Computer Systems, a small developer of sophisticated decision-support and marketing analysis software tools for Fortune 500 users.

IBM will have exclusive marketing rights to sell Metaphor software developed for Intel Corp. 80386-based Personal System/2s and IBM mainframes running MVS. IBM will also have the exclusive right to sell any products that emerge from the relationship, for which Metaphor will receive royalties.

The deal is IBM's most significant venture with an independent applications vendor since its 20-year marketing agreement with Hogan Systems, Inc. in 1986 and the first of its kind since the formation of IBM's Application Systems Division (ASD) last year.

According to ASD President Joseph Guglielmi, the selection of Metaphor technology follows in lockstep with his division's intention to design new software or acquire technology outside IBM. While IBM sells sales and support tools, "what Metaphor has is a much richer set of tools and applications," Guglielmi

Continued on page 89

Cullinet shuffles executive deck again

BY NELL MARGOLIS
CW STAFF

WESTWOOD, Mass. — Further executive changes at Cullinet Software, Inc. last week paved the way for a strategic realignment and probable layoffs, according to John B. Landry III, Cullinet's executive vice-president of development.

David A. Litwack, executive vice-president of systems products, resigned from Cullinet last week after an 11-year tenure. Litwack was instrumental in developing ADS/Online, the company's fourth-generation programming language, as well as IDMS/SQL, the relational data base management system whose introduction three weeks ago gave Cullinet ammunition in the Digital Equipment Corp. market [CW, April 11].

Ron Zambonini, who joined Cullinet as a result of the company's 1987 acquisition of Applied Development Corp. and led the development team for the Knowledgebuild application generator, became vice-president of tools product development. Zambonini will report to Landry.

Redundancy Imminent

Consolidation of tools operations under Zambonini, Landry said, will cure "some degree of redundancy in the tools area." When asked if that consolidation would lead to layoffs, Landry said, "I think it's a pretty safe to assume that any time you find redundancies, you have to take the appropriate actions."

The changes at Cullinet are far from over, Landry indicated.

Cullinet's Landry

"John Cullinane's return [as vice-chairman in March and as chairman earlier this month] has caused a shift in vision at this company," he said. "After a two-year-long dramatic research and development and acquisition period, our objective now is to focus on what we've created and acquired and put it into a framework consistent with the future as we see it."

Exactly how Cullinet sees the future during the second Cullinane administration will emerge in forthcoming announcements, Landry said.

In another appointment announced last week, Donald F. Heitzmann, also an 11-year Cullinet veteran, was named vice-president of data base and data communications products.

The two new appointments, Landry said, "are consistent with our three-by-three architecture. Our objective is to bring both data base lines [the IBM-based IDMS/R and the new DEC VAX-based IDMS/SQL] together under Heitzmann to share their resources, with a fully distributed environment across multiple hardware platforms still the goal."

INDUSTRY WEEK IN BRIEF

The UK's largest computer vendor, International Computers Ltd., said it will base its new computers on the Scalable Processor Architecture, or Sparc, chip and the Unix System V operating system specified by the recent agreement between Sun Microsystems, Inc. and AT&T. International Computers' announcement is the first by a European vendor and follows a similar commitment by Unisys Corp.

A key Prime Computer, Inc. executive, Stephen Kiely, vice-president of systems marketing and development, has resigned to lead Prisma, Inc., a 1-year-old Colorado Springs-based start-up founded by former Cray Research, Inc. engineers. Kiely, who reported directly to Prime Chief Executive Officer Joe Henson, was replaced by Richard Snyder, former vice-president of software development.

IBM took a big step toward exiting the copier business, announcing an agreement under which Eastman Kodak Co. will market, sell and service IBM copiers. IBM will continue to manufacture copiers, but the deal represents another IBM move away from noncomputer businesses. IBM has been transferring the marketing of its typewriters to dealers, and it left the analytical instruments business in 1986.

In an ironic footnote to the current Apple Computer, Inc. graphical interface lawsuit controversy, Xerox Corp. last week completed the spin-off of its former Palo Alto Research Center unit into an independent, venture capital-funded company called Parcplace Systems, Inc. Original development work at the Palo Alto Research Center served as the basis for Apple's Macintosh user interface, which Apple charges has been infringed by Microsoft Corp. and Hewlett-Packard Co.

A recent American Electronics Association survey found that 26% of high-tech firms would manufacture or buy components and products anywhere in the world, despite trade or political implications. Mexico was the leading preferred offshore product location, followed by Japan, Singapore, Great Britain, Puerto Rico, South Korea, Ireland, West Germany and Hong Kong.

As an indirect result of its ongoing microcode copyright dispute with Intel Corp., NEC Electronics, Inc. has announced a new Intel-compatible microprocessor designed solely with hard-wired logic instead of microcode. "Perhaps it will help us around the legal questions," said Henry Eng, NEC's product line manager for microprocessors and peripherals. "If you don't have microcode, you don't have microcode infringement."

Wilder

CONTINUED FROM PAGE 87

Apple jumped 38 places in the Fortune sales rankings to No. 152, and Compaq, nearly doubling its revenue, flew up 127 places to No. 282. Other impressive movers were Advanced Micro Devices (AMD), aided by the acquisition of Monolithic Memories, up to No. 328 (and just shy of the $1 billion club) and Seagate Technology, up 146 places to No. 335.

Speaking of movers, what about Sun Microsystems? Sun debuted on the Fortune 500 at No. 463, but hold on to your workstation: Sun's 156% revenue gain was the fourth-best growth figure on the elite list. Only three chemicals manufacturers outpaced Sun's sales jump, and one of them, Hoechst Celanese, got most of the growth through a merger.

Sun, however, did not bring home top honors for profit growth among Fortune 500 computer systems vendors. That distinction — excluding AT&T and Texas Instruments, which both took significant restructuring charges in 1986 — went to Amdahl, with a 249% earnings surge. Compaq was second at 218%, and Sun was third at 204%.

Joining Sun as Fortune 500 rookies were archrival Apollo, turnkey systems vendor Reynolds & Reynolds, fun-and-games specialist Atari and surging chip, board and micro maker Western Digital, which just made the cut at No. 499.

Among *Forbes'* four different 500 lists, the computer industry claimed three of the top five largest gainers in market valuation. Leading the pack with a staggering 269% market value increase was Computer Associates, which acquired Uccel during the year. Computer Associates, not even ranked among the top 500 in the category in 1986, vaulted to No. 185.

In *Business Week's* ranking of the top 200 business deals of 1987, Computer Associates' $823 million pickup of Uccel came in 35th. AMD's $387 million buyout of Monolithic Memories, at No. 95, was the only other computer-related transaction in the top 100.

Wilder is *Computerworld's* senior editor, computer industry.

The Best Education

For the sixth straight year, the best Seminar Series anywhere in the computer industry is free to all Volume Buyers — corporate and reseller — attending PC EXPO on June 21-23 in New York. In an industry where information and education command a high price, *no other* computer trade event can match the value that PC EXPO provides volume buyers like you.

No one else matches PC EXPO's quality either In fact, most experts rank it #1 in the industry. What's even more important is the response our Seminar Series gets from you. When assessing PC EXPO sessions in terms of applicability to their jobs, overall content and level of information presented, over 92 percent of all Volume Buyers rated them as *very good or excellent.*

Seminar Schedule

Tuesday, June 21

PC EXPO KEYNOTE 9:00 a.m. Ned C. Lautenbach, IBM Vice President, and President, National Distribution Division, kicks off the industry's best Seminar Series.

- □ Selecting a Desktop Publishing System
- □ Legal Developments in the Technology Field
- ■ A LAN Primer: Basic Terms and Technologies
- □ Optical Storage
- □ CASE: A Primer
- ■ Distributed Database: Products or Promises?
- □ What to do While the 80386 Takes Over the World
- □ Costs and Benefits of Microcomputers
- ■ Making the VAX Connection
- □ Software 1989: What Corporations Can Expect, What Users Want
- □ Security Decisions in a Microcomputer Environment
- □ Qualifying for Corporate Account Selling

Wednesday, June 22

- ■ Network Management — Keeping your Network Running
- ■ Groupware: Connectivity for Workgroups
- □ In Graphic Detail
- □ Expert Systems: Real Applications of AI
- □ Portables: A Roundtable Forum
- □ Desktop Publishing: What Corporations are Doing
- ■ LAN Backbones and Bridges
- ■ The Macintosh in the Corporate Environment
- □ Dealing with the Inevitable: Departmental Systems
- □ Discounting: The Return Engagement
- □ Softline: Candid Comments from Industry Leaders
- □ Promoting Responsible End-User Computing
- ■ OS/2 and Networking
- □ Latest Developments in Spreadsheet Software
- ■ Micro-to-Mini Connectivity: Issues and Answers

Thursday, June 23

- ■ How to Grow Your Net
- □ Software Support and Upgrades
- □ Micro-Channel Architecture
- □ What's New in Training?
- □ Establishing a Backup Strategy
- □ Executive Information Systems
- ■ Local Area Network Issues
- ■ Micro to Mainframe Connections
- ■ LANs and Alternatives
- □ Project Management Software
- □ New Lives for Old — What to do with Out-Dated Equipment
- ■ Workgroup Computing
- □ Information Centers: Changes and Challenges
- □ End User Support
- □ Microcomputer Maintenance

■ *Connections '88 Sessions*

Schedule subject to change without notice

Profits

CONTINUED FROM PAGE 87

quarter results came roaring in with better than doubled revenue and a net income increase of 135% above the comparable quarter last year, marking Apple's third consecutive quarter of more than 50% growth. "Their numbers are great, and there's one simple reason: open Mac, which was really their entry ticket to the business market," said Richard Edwards, an analyst at San Francisco-based Robertson, Colman & Stephens.

Edwards also credited Apple's team-selling strategy, "which is going full steam ahead," with contributing to the company's continuing high ride. Moreover, he added, "international operations were very, very strong," accounting for 38% of overall revenue, up from 29% at the end of second-quarter 1987. Apple's reseller system and specialized dealer base, as well as the weakened dollar, should keep the international contribution rising, Edwards said.

The main question raised by Apple's impressive performance is, predictably, how long this kind of growth can continue. "For a while, at least," Edwards said. "They're more focused than anyone else, they're pushing harder than anyone else, and they've got what the world wants."

Lotus Development Corp. Record revenue and solid earnings racked up by Lotus Development Corp. in its first quarter were overshadowed by archrival Microsoft Corp.'s even more dramatic showing and the resignation of Lotus Vice-President Michael Kolowich.

Both events apparently caused Lotus stock to close down 1¼ points at 23½ on the day it announced otherwise impressive gains. Kolowich, who resigned less than a month after the departure of Charles Digate, Lotus's former head of business software development, will become publisher of a new microcomputer magazine.

Microsoft. The Redmond, Wash., firm's 95% profit leap to $37.3 million, or 67 cents per share, was coupled with revenue of $161.8 million, a 65% increase from last year's third quarter.

"Lotus and Microsoft both came in ahead of the Street's projections," said Paine Webber, Inc. analyst Bob Therrien, indicating the sustained strength of the microcomputer sector, which shows no sign of waning. To explain the disparity between Lotus's growth rate and Microsoft's, analysts said, is as easy as 1-2-3. Lotus's efforts to outgrow its one-product identity, analysts noted, have met with scant success, while Microsoft has launched itself into new product markets.

Wang. In striking contrast to the generally good news, Wang reported disappointing third-quarter numbers that may, according to analysts, augur increasingly hard times ahead for the Lowell, Mass.-based minicomputer company. Wang revenue for the quarter ended March 31 showed a meager 3% increase to $767.9 million. Significantly more impressive was the company's net income growth from 1987's weak third-quarter earnings figure of $5.9 million to $22.7 million.

Nevertheless, third-quarter numbers from Wang come as a letdown after the firm's considerably stronger first- and second-quarter showings. Dale Kutnick, executive vice-president of Gartner Securities, Inc. in Stamford, Conn., was not optimistic about which of the contrasting pictures is more revealing.

"I'm not a believer in the Wang comeback scenario," Kutnick said. "I think that the previous two quarters were more of a flash in the pan than a turnaround."

The minicomputer industry as a whole, Kutnick noted, is currently being hit high and low.

"The encroachment of powerful Unix-based workstations — RISC machines, for example — will only increase and will keep taking away from all minicomputer makers who don't offer a good Unix alternative," Kutnick said. Simultaneously, personal computer/local-area network server architecture "is taking a big chunk out of the departmental computing market," he said.

Money Can't Buy

This year, the PC EXPO in New York Seminar Series increases its educational potency by adding a new theme, *Connections '88*. Joining "Management Concerns" and "Technology Issues," *Connections '88* sessions address the challenges of organizing and managing various non-compatible elements of large-scale installations into fully integrated environments where mainframe, mini and micro-computer equipment and software are effectively connected and utilized. In addition, an innovative new highlight, *Connections Lab*, demonstrates several different networking solutions between both compatible and non-compatible products.

Only at PC EXPO, the Professional Volume Buyer trade show, will you increase your technical, educational and professional knowledge, without decreasing your bank account PC EXPO in New York, June 21, 22, 23, Jacob Javits Convention Center. For a complete Seminar Series brochure call 201-569-8542 or write PC EXPO, 333 Sylvan Avenue, Englewood Cliffs, NJ 07632.

Don't Wait in Line—Register Now!

EXPO

June 21-23
Jacob Javits Convention Center
New York

NAME
BUSINESS TITLE
COMPANY
CO. ADDRESS
CITY STATE
MAIL STOP (if any) ZIP
TELEPHONE
Use one form per person. Photocopy if necessary.

By attending the 6th Annual PC EXPO in New York, I consent to the use of photographs of me in any promotional materials related to the show and/or events.

Signed Date
Check here for hotel information

III
AA — Accountant
BB — Administrator
CC — Consultant
DD — Corporate Officer
EE — Creative Arts (All)
FF — Designer (All)
GG — DP/MIS Manager Operator
HH — Engineer (All)
II — MIS Dir./Mgr.
JJ — Programmer
KK — Purchasing
LL — Sales/Marketing
MM — Scientist
NN — Scientist/Fin. Analyst
OO — Service Technician
PP — Systems Analyst
WW — Systems/Applcns. Mgr.
RR — Systems/Architect
SS — Systems/Maintenance
TT — Systems/Mgr.
UU — Systems/Project Mgr.
VV — Systems/Programmer
QQ — Other (specify)

I
TRADE RESELLERS
1 — Computer Consultant
2 — Computer Dealer/Dist.
3 — Computer OEM
4 — Office Products Dealer
5 — Service Vendor
6 — Software Developer
7 — Systems House
8 — Turnkey Vendor
9 — Value Adder
10 — Other (specify)

II
CORPORATE VOLUME BUYERS
A — Accounting Firm
B — Advertising
C — Banking
D — Communication
E — Const./Architects
F — Credit
G — Education
H — Engineering
I — Government/Military
J — Hospital
K — Hotel
L — Industrial Design
M — Insurance
N — Law Office
O — Management Consult.
P — Manufacturing
Q — Publishing
R — Real Estate
S — Research Development
T — Retail Sales
U — Securities Broker
V — Transportation (All)
W — Utility
X — Wholesale/Retail Sales
Y — Other (specify)

MAIL ORDERS must be received by PC EXPO no later than May 20, in which case your show badge will be mailed to you on or before June 7. Mail orders received after May 20 will be processed and the badge held for arrival no later the individual's name at the "Pre-registered attendee" counter in the Crystal Palace Lobby.
Registration fees must be in U.S. funds. All foreign mail orders, except Canada, must be received by May 13, and each badge will not be sent by return mail, but held at the "Pre-registered attendee" counter for pick-up on arrival. All registrations are non-refundable. Confirmation for all registrations will be sent by PC EXPO upon receipt of your registration form and payment.
Mail check payable to PC EXPO with completed registration form to: PC EXPO, P.O. Box 1825, Englewood Cliffs, NJ 07632. Incomplete or improperly completed forms will be returned. PC EXPO attendees must be qualified. Minors under 18 may not register.

Metaphor

CONTINUED FROM PAGE 87

said. "This technology would find great use among our large and mid-size customers."

Six-year-old Metaphor has developed a set of marketing and sales data analysis software programs designed to make interpreting raw data easier for sales and product managers who must intelligently collate massive amounts of information.

Metaphor has earned the reputation of selling an expensive tool that makes accessing other data bases rather simple. Its data base tools support IBM's DB2, data base management systems based on SQL and Oracle Corp. data bases.

The products run on a network of Metaphor-manufactured communication servers and Motorola, Inc. 68000-based workstations. Users, which include Pepsico, Inc. and Johnson & Johnson, can extract data from IBM hosts via a Metaphor gateway and integrate the information into another Metaphor application.

"Our biggest complaint was that we were not IBM compatible," Metaphor President Donald Massaro said. "Now, that will no longer be an issue on Metaphor systems. We will be able to go into accounts that have IBM hardware and our systems, and our software will be completely compatible." The IBM investment is valued at less than 10% of the company, Metaphor officials said.

COMPUTER CAREERS

Making it in manufacturing

Employers seek knowledge of the processes, interpersonal skills

BY SHERYL KAY
SPECIAL TO CW

As the U.S. dollar falls in value against foreign currencies, American goods become more attractively priced for overseas buyers. Meanwhile, managers of manufacturing companies continue to focus on how information systems will help keep them competitive in today's global environment.

"Japanese competition woke all of us up," says Nancy Johnson, new application design manager at Mepco Centralab, Inc. in Milwaukee, a capacitor manufacturer. [The Japanese] devised a system called Just-in-Time, and we've come back with Manufacturing Resource Planning [MRP]. The important thing is that both provide the manufacturer with audit reports and true accountability, so now the systems department is really depended upon to give management the reports it needs to react to any immediate market or workplace changes."

For the MIS professional who wants to become an important player in helping his company maximize its bottom line, the manufacturing systems that actually support production are a good place to be today, according to Jim Barcus, senior vice-president of Worldwide Information Services for The Black & Decker Corp. in Towson, Md. He stresses that markets are captured by a company's products, not by the automation of paperwork.

"It's hard to imagine a more rewarding area for information systems professionals to be involved with today," Barcus says. "Here you can see actual results from the systems you've developed — real reduction in product development cycles and improved product cost."

Specialists in demand

According to Barcus, the weaker dollar together with this realization of the role of information systems has translated into more jobs for manufacturing applications specialists.

"You have to market and sell, but at the end of the day you must have a product that works, that people want and [that] has a reasonable cost, and that's exactly what MIS can give to the manufacturer."

Those systems professionals with specific manufacturing applications experience might earn salaries 10% greater than average in their field.

According to Steven Joffe, vice-president of San Francisco-based recruiting firm Source EDP, programmers in manufacturing may average $27,000 to $38,000 per year, while systems analysts are in the $35,000 to $45,000 range and project leaders average $45,000 to $55,000 annually.

Although salaries may be attractive, companies find it difficult to locate qualified technical professionals with manufacturing experience, particularly at the analyst level.

"Our systems analysts don't code, so user interface is most important," Johnson says. "They have to know how the bill of materials is structured, how the inventory is controlled and costed. The industry knowledge is critical."

Personality is also important. "You need a fair amount of patience," Joffe explains. "Manufacturing people are not computer people, so companies look to hire systems professionals who can adapt easily to whomever they are talking to, including warehouse employees."

At Black & Decker, numerous projects are under way for the coming year, including integration of computer-aided design with computer-aided manufacturing, creation of worldwide design and production centers and development of a new worldwide purchasing system. All projects will require employees with a good technical background. But, Black & Decker's Barcus says, "we are now looking a lot more carefully at an individual's interpersonal skills and analytic business abilities."

Corporate crossover

Another attraction of working in manufacturing systems is the potential for crossing over to corporate operations. Systems designers who have acquired an in-depth knowledge of how the manufacturing cycle works could move into production, inventory and other related areas.

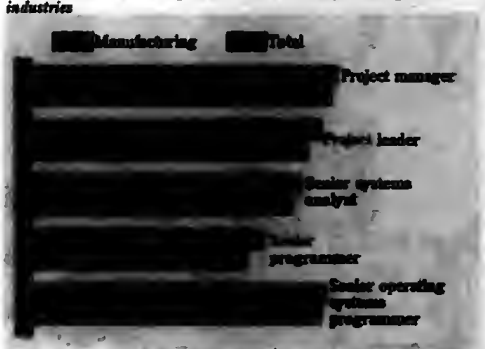
Barcus is an example. After spending years in information systems at Black & Decker, he moved on to several executive positions in manufacturing operations before switching to his current role overseeing all worldwide manufacturing systems.

Programmers in nonrelated industries may find that a transition to manufacturing is not too difficult. "Especially coming from banking," Mepco Centralab's Johnson says. "They do a lot of on-line processing, and that's a good talent for a manufacturing company to have." Systems analysts and project leaders, on the other hand, need the industry experience.

Kay is an MIS human resources consultant based in Tampa, Fla.

Making it

Salaries in manufacturing compared with average earnings for all industries



INFORMATION PROVIDED BY A *COMPUTERWORLD* / DATA PROCESSING MANAGEMENT ASSOCIATION 1987 SALARY SURVEY
CW CHART

DP OPPORTUNITIES

HARTFORD, CT 06103 (203) 278-7170
One Commercial Plaza

SYST ANALYSTS
Multiple new openings now avail at major vendor's locations in upstate NY & VT. Lang's sought: PL/1, C, COBOL or FORT. IMS, DB2 or other DBMS is a plus. Excell oppty, rural loc's, paid relocation – 2+ yrs exp req'd. Salary to $40,000.

PROJECT MANAGERS
State-of-the-art IBM cust seeks mgrs to lead sys dev projects. Bkgd with pensions, fin'l serv's, elec fund xfer, or invest mgmt syst's req'd. Tech skills include IDMS, CICS, ADS/O, or DB2. Sr level growth oppty. Suburban loc. Salary $45-55,000.

TELECOMMUNICATIONS – VOICE/DATA
Multiple oppty's for indiv's with bkgd/exp with Voice/Data network. Tech & economics. Exp with network mgmt, network switching, transmission tech's, & network design. Sr level oppty's offer exceptional growth. Salary $45-55,000.

BUFFALO, N.Y. 14202 (716) 842-0001
420 Main Street, 1112 Liberty Building

DATABASE MANAGER/ANALYST
Giant Western New York financial institution needs Database Technical Manager and Senior Analyst for DB2 & IDMS environment. Will consult/support growing DB usage for expanding application development teams. Highly visible, dynamic growth opportunity. To $65,000.

RPG III ANALYST PROGRAMMER
Fast paced upstate New York manufacturing firm needs senior analyst programmer for growing S/38 department. Prefer minimum 2 years experience plus knowledge of manufacturing. Outstanding career growth in stable company. To $35,000.

NASHVILLE, TN 37217 (615) 361-4000
1101 Kermit Dr.
Prestigious Nashville client has an immediate need for 5 professionals to develop application software for the communications industry. Candidates should be knowledgeable in Order Processing, Inventory Control, Cost Allocation, Software experience must include CICS, COBOL, VTAM, VSAM, m On-Line and Batch Systems. To $38,000.

ROBERT HALF
DATA PROCESSING
PERSONNEL SPECIALISTS

Contact Manager at office listed above. Client Companies Assume All Fees.

SOFTWARE OPPORTUNITIES
1 800 423 5383
ROBERT SHIELDS & ASSOCIATES

IDMS Professionals
P/A ADS/O CICS, Tlse $35-38K
S/A ADS/I MSA Tlse $40K
P/A DMS CICS, Tlse $38K
S/A ADS/O Dmn Tlse $47K
P/A ADS/O Comm Tlse $38-40K
P/A ADS/O CICS, Tlse $39-42K
Sr P/A ADS/I CICS, Tlse $37-42K
SSA III Sr. ADS/O Tlse $40K
SSA Supv, Dtn, Tlse $37-42K
SSA Supv ADS/I CICS, Tlse $40K
SSA Sr. Network Tlse $40K
CMA GROUP
7100 E. Belleview Ave, Ste. 14
Englewood, CO 80111
303-779-8890

For 22 Years We've Hired the Best
Did We Miss You?

We are Automated Concepts Incorporated (ACI), a leading consulting and software development company. For 22 years we've hired the industry's most talented people to build systems. Our continuing success has produced additional career opportunities in Chicago, Los Angeles, New Jersey, New York and Washington, DC for professionals with experience in:

- COBOL or PL/I
- CICS
- DB2
- IMS DB/DC
- IDMS
- ADABAS/NATURAL
- MODEL 204
- UNIX®
- C
- ASSEMBLER
- ADA
- ORACLE
- INFORMIX
- TANDEM

In addition to our highly competitive salaries, ACI offers medical, dental, life and disability insurance; 401(K) plan; paid vacations; tuition reimbursement, internal and external training in leading technologies.

Call COLLECT (212) 725-4540 OR send resume with salary requirements and location desired to:

National Recruiting Office – Attn: Lisa Semmes CW 425

Automated Concepts Incorporated
386 Park Avenue South
New York, NY 10016

aci automated concepts incorporated

®UNIX is a trademark of AT&T Bell Laboratories
equal opportunity employer m/f

CSIRO
AUSTRALIA

RESEARCH STAFF

PROJECT LEADER
SOFTWARE ENGINEERING

$A36,421-$A49,256

DIVISION OF INFORMATION TECHNOLOGY
NORTH RYDE, NSW, AUSTRALIA

The Division: The Division of Information Technology has recently established laboratories in Sydney, Melbourne and Canberra, supporting collaborative research and development in the following fields:

Computer networking and OSI
Software engineering and related hardware
Telecommunications policy
Spatial information systems

The Job: The appointee will have managerial responsibility for The Software Engineering project which is part of the Software Engineering and Related Hardware program. The project will be expanding from successful work in the software engineering of expert systems, and will develop methods and tools relevant to the engineering of conventional commercial information systems. The initial focus in the latter will be to look at the problem of extending information analysis methods to the specification of process.

The appointee will have responsibility to:

- Provide overall intellectual direction for the tasks in the project.
- Manage the resources available to the project.
- Consult with and co-ordinate with users of the technology, and with researchers in other organisations.

The Person: A PhD degree or equivalent qualification in Computer Science or related discipline. Demonstrated research experience in the development of sizeable computer software systems. Experience with software engineering technology, information analysis and/or relational data base technology. Experience with expert systems, and development of computer aided software engineering tools would be desirable.

Conditions: Appointment will be for an indefinite term with Australian Government superannuation benefits available

More Information: Prospective applicants are invited to telephone Dr R Colomb, telephone no (02) 887 9370 for further information. A copy of the detailed job description can be obtained from Miss Pam Millon on (02) 887 9357.

Applications: Quoting reference no. A3822 should be submitted stating relevant personal particulars, including details of qualifications and experience, the names of at least two referees should be directed to:

Acting Chief,
CSIRO, Division of Information Technology,
P.O. Box 1599, Macquarie Centre,
NORTH RYDE, NSW 2113, Australia.

by 27 May 1988

CSIRO IS AN EQUAL OPPORTUNITY EMPLOYER

ATTENTION:

DB2, CICS, ASSEMBLER, And C Programmers

Develop Tomorrow's Leading Products Today

Ten years ago, Compuware introduced Abend-AID® and helped change the way programs are debugged at over 4500 IBM mainframe sites worldwide. Since then, Compuware has introduced more products that continue to set software standards, keeping us at the forefront of programmer productivity tool developments. Compuware is now one of the world's largest independent software providers.

Today, Compuware needs 40 experienced software developers and product implementation specialists to bring exciting new products to market . . . products that will help shape testing and debugging standards for the 1990's!

If your background includes extensive DB2, CICS, IMS, ASSEMBLER, C, PL/1, or Systems Programming, come explore our systems software opportunities.

Compuware can challenge, motivate and reward the brightest and best programmers with 40 of tomorrow's best career opportunities.

To learn more about how you can help set tomorrow's standards, let us hear from you soon. Please send resume and salary requirements to Richard McAteer, Compuware Corporation, Department R, 31440 Northwestern Highway, Farmington Hills, MI 48018-5550.

COMPUWARE
Because experience is everything.

An equal opportunity employer

Abend-AID is a registered trademark of Compuware Corporation.

COMPANY WISE CAREER WISE

Valmont Is The Smart Move.

Revenues of $445 million. A fourfold earnings increase. A 1987 growth rate of 42%. We're Valmont Industries, Inc., a diversified, international manufacturer of fabricated steel products located near Omaha, Nebraska—offering Programmer/Analysts an intelligent career choice.

Our Information Services group is an integral component of Valmont's strategic growth objectives and we are making significant staff additions in the Application Development area to support our ambitious new application plan. We utilize an IBM 3090-180E computer, relational database technology and a fourth generation programming language.

It all means opportunity for exceptional and competitive individuals who possess:

- 2 years recent mainframe programming experience required preferably involving COBOL, DOS, CICS, VSAM, Datacom, Ideal and 4th generation languages in a manufacturing environment.
- Bachelor's degree or equivalent.

Make the smart move. We offer competitive salaries, a strong benefits program, relocation assistance, flexible scheduling, guaranteed continuing education and a modern corporate environment where suburban, rural, urban, and lakeside lifestyle options are available. For immediate consideration, send your resume, including salary history and expectations to: **Pile PLC-465, VALMONT INDUSTRIES, INC., Highway 275, Valley, NE 68064.**

VALMONT

An Equal Opportunity/Affirmative Action Employer
Only non-smokers will be considered.

PERMANENT AND/OR CONSULTING POSITIONS

DEC

- Programmers–VAX, VMS BASIC
- Systems Prog'rs-VAX, VMS, BASIC

HONEYWELL

- Prog'rs-GMAP, GCOS, 3 or 5

IBM

- Prog'rs-COBOL, CICS, PL-1
- Commun Spec.-CICS, TCAM

Please call 212-594-3660
Or Submit Resume to:

HANK WALSH ASSOCIATES
475 Fifth Ave, NY, NY 10017

OVERSEAS JOBS!!

SECURE YOUR FUTURE TODAY!!

Our clients are hiring NOW for:

PROGRAMMERS/ANALYSTS
•SBS/CICS/ADABAS/IDMS
•RPG II, SI/ORACLE/PCS

SYSTEMS PROGRAMMERS
•PRISM/VM/ADABAS/IMS

SOFTWARE ENGINEERS
•CASCOM/IMS/C

TECHNICIANS
•IBM SP/HP/DEC-VAX

MANY OTHER FIELDS

Sunday 9:00–3:00
Weekdays 8:30–5:30

(213) 382-9999

OVERSEAS CAREERS
OF CALIFORNIA AGENCY
3731 Wilshire Bl. Dept. 222CW
Los Angeles, CA 90010
Advance Fee
Fully refundable if not placed
per contracts
Licensed and bonded as an overseas employment agency
OFFICES WORLDWIDE

VAX
Senior Engineer

Responsible for general system administration of 8530 based VAX-cluster on Ethernet LAN in a campus–like research environment. Responsibility for hardware and software integration, network design, and design and implementation of a state of the art user environment. This is a high visibility position and requires superior interpersonal skills as well as expert credentials. Salary to $40,000 depending on qualifications.

Candidates should have:

- strong system management and programming background with VAXClusters and IBM-PCs,
- knowledge of FORTRAN, C, relational database systems, networking technology, and system development methodology, and
- at least 3 years' experience in systems programming, system management, or system design is required.

ASSOCIATION OF AMERICAN RAILROADS

Send resumes to:
O. K. Ahmed
Association of American Railroads
3160 S. Federal Street
Chicago, IL 60616
(312) 567-6751
Equal Opportunity Employer M/F/V/H

DP Consultants
Come Home To Gracious Living...

Midwest is Best.

Computer Horizons Corp. is one of the top DP consulting firms in the country with sales now exceeding $70 million and a highly successful network of offices from coast-to-coast. Now you can have the best of both worlds with us/an ideal lifestyle in the Midwest known for its charm, hospitality and tranquil way of life; and a professional career that lives up to your expectations.

As solution experts to an impressive list of Fortune 500 clients in six major market areas, we set the pace in new and emerging DP technologies, from mainframe, mini- and microcomputing, to Relational Databases, AI and Expert Systems.

With CHC you can lead your profession, make decisions, and see your ideas work as real solutions. Join our outstanding professional team and have the career and lifestyle you've always wanted.

Our increased project demand and unprecedented growth have opened up exciting opportunities in • Cincinnati • Indianapolis • Kansas City • Columbus • Cleveland • Louisville • Detroit • Chicago • Minneapolis.

If you're a creative and astute Programmer/Analyst, Analyst, Project Leader or DBA who welcomes new challenges and reaches for top performance, you can really grow and achieve with CHC in the Midwest, the largest region in our Company. Influential and highly visible roles are available for DP professionals with design or implementation experience in the following areas:

- IDMS/ADSO
- IMS DB/DC
- COBOL/CICS
- DB2
- PL/1
- FOCUS
- UNIX "C", Switching Systems
- ADABAS/NATURAL
- TANDEM
- PROGRAMMERS w/Q Clearance
- ORACLE
- HONEYWELL, DM IV

CHC provides excellent salaries; one of the finest benefit programs in the industry including company-paid relocation; health, life, dental and disability insurance, unlimited tuition refund, as well as our deferred income savings plan (401K), and a team-spirited, progressive environment.

To find out more about your unique advantages with CHC, please call or send your resume, indicating position of interest and location of your choice, to:

Barry Olson
313-588-1900

COMPUTER HORIZONS CORP.

84 Executive Drive
Troy, Michigan 48083
An Equal Opportunity Employer M/F

DATA BASE CAREERS

• IDMS DBA	Dallas	$45K
• IDMS DBA	Austin	$38K
• IDMS DBA	San Antonio	$40K
• IDMS ADS-O	Dallas	$40K
• IDMS ADS-O	Macon	$45K
• IDMS ADS-O	Sacramento	$40K
• IDMS ADS-O	Miami	$45K
• IDMS ADS-O	Sydney, Aus	$50K
• IDMS ADS-O	NC/VA/GA	$40K
• IDMS ADS-O	Phoenix	$42K
• IDMS Dev Mgr	Miami	$55K
• IDMS CAS/CAM	San Fran	$55K
• ADABAS Sr. P/A	Denver	$50K
• DB2 Analysts	Dallas	$40K

Send resumes in confidence to:
[illegible]
[illegible]
[illegible]
Dallas, Texas [illegible]
(214) [illegible]

IRON & STEEL INDUSTRY
Saudi Arabia

Saudi Iron & Steel Ltd (HADEED) is a recently established iron and steel producing company, located in the new industrial city of Al-Jubail. Initial rated capacity (800,000 MT/YR) has been exceeded and the company, now embarking on a programme of process enhancement, is seeking to recruit a qualified Technician to fill the following vacancy.

HARDWARE MAINTENANCE TECHNICIAN

The company has installed Prime 750/550 mainframe computers and in the future will install a Prime 6350 in addition to peripherals, teletype tape drives, GDC disk drives, Data Products printers, Oki printers. The Prime 750 (and 6350) are linked by Prime network. The maintenance technician is responsible for in-house Prime system maintenance, peripherals, hardware and ordering of spare parts, and the instructioa of local Nationals.

The successful candidate will have had professional training with Prime hardware, various brand peripherals, five years field experience and a knowledge of electronics and microprocessors will be considered an advantage.

The company is part of the prestigious SABIC group of companies and offers generous tax free salaries and terms and conditions of employment including free furnished accommodation, health care, personal insurance, education allowance, terminal gratuities, car purchase scheme, 6 weeks annual vacation and air tickets etc.

Qualified and experienced applicants should write with their c.v. and contact telephone numbers to Malcolm Grundy — Executive Director,

MORGAN DAY LTD
RECRUITMENT & SELECTION CONSULTANTS
65 Carshalton Road, Sutton, Surrey, SM1 4LH, United Kingdom
Tel: (0)1-642 4437

What's REALLY Important to You?

Challenge?
Environment?
Compensation?

Abator/Cameron assists DP professionals meet today's three career priorities:

- Highly visible, challenging projects using current technologies
- Consulting assignments or Career positions in desirable locations – midwest, north central, southeast and west coast – with large corporate clients.
- Excellent earnings opportunities.

Programmer/Analysts, Systems Analysts, Systems Support for Applications, Networking or Telecommunications Development

Suggested Skills

LANGUAGES: COBOL or PL/1 or ASSEMBLER or "C"
IBM: IMS DB/DC or DB2 or CICS or IDMS or COPICS
IBM S/34 or S/38: RPG II or III or MAPICS
TANDEM: TAL or PATHWAY or ENABLE or ENFORM
4th G/L: ADABAS/NATURAL or SQL or MANTIS
HP 3000: IMAGE or POWERHOUSE or SPL
DEC VAX: VMS with RDB

CALL or SEND RESUME:
Joanne Peterson or Judy Gillespie
1-800-544-1210
In PA Call (412) 247-8000
1601 Penn Ave. Suite 106
Pittsburgh, PA 15221
Valerie Giudice
(415) 375-1440
[illegible] Airport Blvd, Ste 404
Burlingame, CA 94010
An Equal Opportunity Employer M/F

ABATOR/CAMERON
Subcontractors Welcome

SOUTHERN CALIFORNIA
P/A's & Systems Programmers

We are currently searching for:

Application Programmers, with any of the following:
- DB2
- Systematics
- Securities Investment
- CICS & IMS

Systems Programmers, with any of the following:
- VM
- MVS/SP & XA
- VAX
- Software Developers

Positions w/relocation packages available. Submit resume w/salary history to: P.M. FEIN, INC. Executive Search Firm, M. Riley, 5730 So. Sepulveda Blvd. #220, Los Angeles, CA 90045. (213) 649-[illegible].

VM SYSTEMS PROGRAMMERS

Well established and highly professional Alaska based computer service and sales company is seeking VM Systems programming professionals for independent contract and employment opportunities. Minimum of 3 - 5 years systems programming experience required, with specific expertise in VM and the MVS/XA environment.

Send resume stating precise hardware/software experience and 3 references to:

CompRite Systems, Inc.
[illegible]
Suite [illegible]
Anchorage AK [illegible]
(907) [illegible]

SYSTEM SOFTWARE SPECIALIST

Major University seeks Computer System Software Specialist to develop, modify, and assist with installation of computer software systems. Requires MS in Computer Science. Must have knowledge of IBM 4300 Series hardware structure; IBM Operating Systems VM/CMS and DOS/VSE, computer languages REXX, FORTRAN, PL/1 and IBM assembly. Statistical package SAS and STSS. Salary $25,000 per year. Contact, B. Jo Lyell.

Tennessee Department of Employment Security
C1-114 Cordell Hull Building
Nashville, TN 37219

ANALYST/PROGRAMMER

Small division of a major Midwest corporation seeks an IBM Cobol Programmer Analyst with solid IMS experience. Will work with users on all business applications. Any 4th generation language background would be preferred. Great benefits. Salary to $[illegible].

[illegible]
DATA PROCESSING
7720 Forsyth Blvd.
St. Louis, MO 63105
(314) 727-[illegible]

DATA COMMUNICATIONS SOFTWARE SPECIALIST

Telefile, Inc., a growing mfr of data comm. systems, has several openings in our product development group for motivated and experienced software specialists. Telefile offers a fast-paced, ground floor opty with significant responsibility to develop products for the int'l market. Excellent benefits pkg. Successful candidate must have 1-3 yrs experience developing X.25/X.75 packet switching software using 68,000 Assembly and C languages. BSEE or Computer Science preferred. Send resumes to Attn: Patrick Peterson, Telefile, Inc. 17131 Daimler St., Irvine, CA 92714. Principals Only. No phone calls please. EOE.

PROGRAMMER ANALYST

Major softdrink bottler and distributor seeking person with S/36 and S/38 experience. 3 plus years with RPG II and RPG III. Excellent benefits including 401K. 20% travel in Florida and Georgia. Must have strong communication skills to work with users. Duties to include software development and installation of computer systems at our branches. Salary range $[illegible] to $[illegible]K. Send resume and 3 references to: Personnel, P.O. Box 17[illegible], Jacksonville, FL 322[illegible].

S/38

Programmer/Analysts for software development & consulting positions in various locations. Flexible relocation policy. Move with us to "Silverlake"! Send resume to:

Mincron
350 Fifth Ave.,
Suite 7120
New York, NY 10118
(212) 736-7870

IDMS-ADS/O IMS DB/DC

We have several openings in our expanding development staff for DP professionals with 3 - 4 years exp. These assignments are in our Portland, OR branch office.

If interested in a rewarding career in a growth oriented organization with offices in Sacramento, Seattle, Boise, and Salt Lake City, please contact:

PRODATA INC
Attn: Bob Hiatt
2140 SW Jefferson #130
Portland OR 97201
(503) 223-[illegible]
An Equal Opportunity Employer

COMPUTER SPECIALIST

Assist VA Medical Center ADP Site Manager in implementing a patient data system based on MUMPS. Debugging, customizing, developing special applications. 8:00 - 4:30 M-F, occasional overtime. Beautiful upstate New York rural community with easy access to Rochester, NY, urban delights. $27,715 to start, potential to $[illegible]. Promotion opportunities throughout the nation in the largest hospital system in the country. Call the Recruiting Desk, (716) 394-2000, ext. 3709/3710 or write: VA Medical Center, (05) Canandaigua, NY 14424. A Federal competitive civil service position. EEO Employer.

GET THE MOST FROM YOUR EXPERIENCE AT FIRST DATA RESOURCES

As a growing leader in data processing and leading edge technology, First Data Resources, a subsidiary of American Express Company, is one of the most progressive companies in the financial transaction processing industry. Our highly advanced systems environment helps support our continually expanding application needs, and we now have several excellent opportunities for experienced individuals seeking additional challenge and growth potential.

BAL PROGRAMMER ANALYSTS

To qualify, you will need a minimum 2 years IBM Assembler background and the ability to work with minimal supervision. You will analyze and code new & existing systems from walk-through thru implementation. Knowledge of CICS Tables & Control Blocks helpful.

COBOL PROGRAMMER ANALYSTS

To qualify, you will need a minimum 2 years COBOL programming experience. Thorough familiarity with VSAM, OS/JCL, testing techniques and IBM utilities is essential.

SYSTEMS ANALYSTS

To qualify, you will need a minimum 5 years experience in a sizable IBM environment. Proficiency in COBOL and OS/JCL is essential as are excellent communication skills. Some project management experience is also a plus as successful candidates will be selected to serve in this position through implementation of larger projects on which they have done the analysis and design.

If you want to become an integral part of the innovation of FIRST DATA RESOURCES, take advantage of a competitive compensation package and make a BIG contribution, send resume with salary history to: DEBORAH POOLE, 1-800-823-6467, in Nebraska call (402) 399-7946.

FIRST DATA RESOURCES INC.
10825 Farnam
Omaha, NE 68154

An Equal Opportunity Employer M/F

HOW MUCH SHOULD YOU BE EARNING IN 1988?

Call or write [illegible] for the latest data right on computers. You'll find out:

- How salaries are directly affected by your area of specialization in computing;
- How your experience level plays an enormous part in determining your salary;
- What technical specializations are in most demand and how much of a premium many firms are willing to pay for your expertise.

It's the most comprehensive National Salary Survey we've ever published.

Gain new insight into your own progress

The new 1988 Survey will not only give you a thorough assessment of where your skills and expertise fit into today's marketplace. You'll also get valuable information to help ensure that your career and salary will never be blocked or short-circuited. The new Survey provides a series of charts and graphs to help you understand your own progress, assess where your career is headed and develop strategies to make sure you're staying in the mainstream of your career.

In short, it's "must reading" for anyone who's interested in maximizing their chances of success.

Best of all it's FREE

The new, 1988 Computer Salary Survey and Career Planning Guide is published as a free service to the profession. As the leading recruiting firm that specializes exclusively in computing, we want to assist you in establishing and achieving your professional objectives. All our associates are computer professionals who have the experience you need to help you achieve your professional goals.

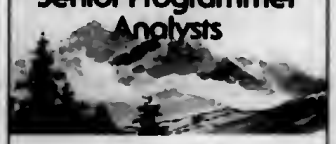
Call 1-800-530-4200, ext. 115 today

Or, write to the address below. Either way, your copy will be mailed to you free.

source edp®
Computer Planning Specialists

Department 5004, PO Box 7021, Ann Arbor, MI 48107-7021

Senior Programmer Analysts



NOMAD II

EG&G Idaho, Inc., prime operating contractor for the Department of Energy's Idaho National Engineering Laboratory, has immediate openings for proven 4 GL Professionals.

Successful candidates will be responsible for the design and implementation of decision support systems in an IBM 3083 VM/CMS environment. The positions involve defining, developing and implementing information systems primarily for users in the nuclear waste management area of the company. Individuals with 3 plus years experience using NOMAD II are desired. Excellent verbal and written communications skills are essential. A BS degree in computer science is preferred.

Idaho Falls is located in the heart of the country's most scenic recreational areas. Please send your resume, with salary history and references, in confidence to: Employment Services, (Code WSP-21), P.O. Box 1625, Idaho Falls, Idaho 83415. Equal Opportunity Employer M/F/H/V. U.S. Citizenship required

EG&G Idaho, Inc.

Senior Computer Systems Analyst wanted to analyze complex business and financial systems, design, develop and implement enhancements to Reject Reentry Check Processing System using COBOL and XEPL computer languages on Burroughs mainframe computer, specifically the B4900 Document Processor and the Burroughs B3900 mainframe, perform system's analysis and use structured design methodologies in the development of a new level of Burroughs Item Processing System (IPS) software. Requires Bachelor's degree in Computer Science or Business Administration and 2 yrs exp; $56,000.00 per/yr; 40 hrs per/wk. Send resume to 7310 Woodward Ave., Rm 415, Detroit, MI 48202. Ref. #23786 "Employer Paid Ad."

COMPUTER SALES

We are a small, aggressive, Inc. 500 IBM System/38 Value Added Reseller (VAR) specializing in Credit Union Software. We sell nationally and internationally to growing Credit Unions.

We can offer you a choice of multi-state territory, a lead truck to sales management, base salary, commission, assistantship, stock options, and fun.

You must be a quota breaker with mini-computer software sales experience. Paid relocation to the Washington, D.C., area is mandatory.

Please call me at (703) 448-9400 to discuss this opportunity. Ed Robinson.

DEXEL SYSTEMS CORPORATION

UNIX PROFESSIONALS

Seeking additions to our permanent staff with MS Comp Sci/EE with the following exper.:

- Software Engineers (UNIX, Database, Communications, Op. systems or real-time dev.)
- Software Test Engineers (Sr., Network system software)
- Documentation Programmer (UNIX, Software Dev., and Doc.)

We are UNIX specialists offering a very competitive salary and benefits package, plus the opportunity to work with the best in the field.

The Prelec Group Inc.
3041 Kenny Rd., Suite 208
Columbus, OH 43221
(614) 487-0888

UNIX is a trademark of Bell Labs

KENDA SYSTEMS, INC.
Boston • New York • Washington

SOFTWARE CONSULTANTS

KENDA SYSTEMS provides consultants to the East Coast High Tech Community. Talented professionals who take pride in their work are welcome to register with KENDA SYSTEMS.

Current Requirements include:

• DATABASE:	VAX/VMS/RELATIONAL DB DESIGN
• DRIVERS	VAX/VMS (I)/MACRO-32 AND C
• PAK:	VAX/VMS/C/DL32
• PORT:	CONTROL SYSTEMS PORT 68K-8086 TO XENIX
• SYSTEMS DESIGN:	VAX/ADB/XENIX STRUCTURED DESIGN
• QA:	NETWORK TESTING TCP/IP/NFS
• COMMUNICATIONS:	C/TCP IP/INTERFACE
• GRAPHICS:	UNIX/C/X0000/ WORKSTATION SOFTWARE
• DIAGNOSTICS:	REX/UNIX/C
• TEST:	PC AND MAINFRAME FOCUS SYSTEMS
• TECH-WRITER:	USER MANUALS/C LANGUAGE

Forward resume to D. Sierra.

2 [illegible] Plaza, Suite [illegible], Dallas, [illegible]

dp

Atlanta/Dallas

DataPro is now seeking computer professionals for over 500 new local openings and more than 4,000 national career opportunities through our nationwide affiliates. During our 18 years experience in the dp field, we have established ourselves as one of the foremost authorities on dp career development. Contact us first, see what we can do for you! 400 Perimeter Ctr. Ter. #680, Atlanta, Ga. 30346, (404) 392-4242; or 13355 Noel Rd. #1601, Dallas, TX 75240, (214) 661-8600.

DataPro Personnel Consultants
Member of National Computer Associates

MacCORMACK & DODGE or MSA

SOFTWARE PROFESSIONALS

$30,000 - $75,000+

POSITIONS AVAILABLE NATIONWIDE FOR:

- Programmers
- Analyst
- Project Leaders
- Managers
- Consultants
- Users

If you have "hands-on" MAD or MSA experience and a degree:

Send resume to:

BGT, Inc.
1211 N. Westshore Blvd.
Suite 502
Tampa, FL 33607

Experienced DBA's with backgrounds in IDMS, IDMS/R, DB2, ADABAS, ADS, [illegible] and systems in the U.S.? Call or write:

Dunhill
The Professional Personnel System
[illegible]
(305) 492-8010
(305) 371-2808 Collect in Florida

FLORIDA

SR Progr'g Analyst

$42,000

NYSE listed Co. seeks 3 yrs exp in CICS & ASSEMBLER. Refine and redo info systems. Any Telecom exp big plus. High visibility.

Russell Warner Associates
2060 North Lois Ave.
Suite 700
Tampa, FL 33607
(813) 870-0888

Data Center Supervisor

Join us in Phoenix, Arizona

Sophistication. From our networks to our mainframe systems and applications programming. At American Express, we're providing technical talent an opportunity to achieve their professional goals in computer technology. We're more than just a well known name...we're an industry leader with some of the most sophisticated computer opportunities.

As night shift supervisor, you will be responsible for reliable access for IMS on-line systems, as well as operation and monitoring of 3090 IBM mainframes and 3380 DASD hardware. At least 5 years data processing experience is desired, including MVS, JES II, IMS, TPF and VTAM system software, JCL utilities, RACF, data base recovery and TSO. At least one year supervisory experience with excellent interpersonal skills is required. This is a night shift position, 3 - 4 nights per week, 10 or 12 hours per night.

We provide a comprehensive benefits program plus an excellent opportunity for growth. Send your resume to P. Taylor, AMERICAN EXPRESS, P.O. Box 53781, Phoenix, Arizona 85072-3781.

An Equal Opportunity Employer

Senior Information Systems Trainer

At Ralston Purina, we are committed to developing leading edge information systems for our entire organization. We currently have an opportunity for a Senior Information Systems Trainer. Reporting to the Training and Development Manager, you will be responsible for developing and teaching data processing courses, evenly divided between IBM Mainframe and IBM PC.

To qualify, you need a Bachelor's degree in Data Processing or Computer Science and at least 3-5 years' experience developing and teaching data processing courses for large IBM Mainframes and IBM PCs. We prefer experience in the following software products using IBM equipment: SAS, IMS, DATACOM/DB, ISPF, TSO, COBOL, RAMIS, FOCUS, JCL, IFPS, DOS, LOTUS 1-2-3, and DW4.

We offer an excellent salary and benefits package with outstanding career advancement opportunities. To apply, send your resume and salary history to: **Manager, Employee Relations; RALSTON PURINA COMPANY; Department A-S; Checkerboard Square; St. Louis, MO 63164.** An Equal Opportunity Employer.

Ralston Purina Company

ANALYST/PROGRAMMER

Wells Mfg. Corp. is the leading independent manufacturer of automotive ignition components for the retail aftermarket. We have an ideal opportunity to join a rapidly developing and progressive MIS Department. The initial assignment for this senior level position will be a systems conversion to a relational data base in an on-line/real-time environment. Future assignments will involve the development and expansion of new programs. Our environment includes an IBM 4341 (DOS/VSE/SP), a DEC VAX (VMS), CICS, COBOL, VSAM, Easytrieve, PC LAN, BAL and DBOMP.

Requires a 4 yr. degree or equivalent, 4 years of DP experience, a strong manufacturing background, large project experience, analytical ability, effective communication skills, 4GL, and COBOL.

Our location in the beautiful Fox Valley is within one hour of Milwaukee and Madison. We offer a competitive salary and a comprehensive benefit program including tuition reimbursement. Candidates should submit a resume and salary requirements to our Human Resources Department.

WELLS MFG. CORP.
P. O. Box 70
Fond du Lac, WI 54936-0070
Equal Opportunity Employer M/F/V/H

MIS DIRECTORS

If you need good people, we've got them. Computerworld reaches more than 612,000 computer pros every week. That's more qualified computer pros than any newspaper can deliver. And you can select either a regional edition or national edition of Computerworld's Computer Careers section for your ad.

For more information, or to place your ad regionally or nationally, call Lisa McGrath at 800-343-6474 (in MA, 617-879-0700).

Weekly.
Regional.
National.
And it works...

MUMPS

Group Health Inc., has excellent opportunities for experienced MUMPS Programmer/Analysts for our Managed Care Clinic Information Systems, operating on a large VAX cluster. Skill requirements include: design, analysis, and programming. Knowledge of VMS is a plus.

Group Health Inc., a leading Midwest managed health care provider is currently servicing 225,000 members through more than 35 full service medical centers and affiliated clinics located throughout the Twin Cities.

We offer excellent compensation and benefits. Please send resume and salary requirements in confidence to:

GROUP HEALTH INC.

Attn.: Laurie Jones
2829 University Ave. S.E.
Minneapolis, MN 55414
EO/AA Employer
NO AGENCIES, PLEASE.

NYTRON
Data Processing

MAPPER COORDINATOR

This position is responsible for developing MAPPER application programs and performing MAPPER coordinator responsibilities on a Unisys 1100/71. The candidate must have a strong MAPPER programming background, working knowledge of well balanced data base design and enjoy working in an aggressive environment. Ideally, the candidate should be familiar with MAPPER graphics, batch control and perform in an interactive managerial role. TIP and TELCON knowledge would be of benefit. Please submit resume to:

Michael G. Harris
VP — Human Resources
NYTRON CORPORATION
4949 LeBourget Drive
St. Louis, MO 63134

TECHNICAL CONSULTING

TECHNICAL [illegible], INC. is a leading provider of technical education, management and implementation services to Fortune 500 clients in the Chicago area. Expansion of our client and project base has created opportunities for individuals with a minimum of 5 years experience and proven design and programming skills in the following areas:

SYSTEM PROGRAMMERS – Solid technical experience in VM/CMS and/or VTAM/NCP.

CICS APPLICATION DEVELOPERS – Experience in BAL and/or COBOL, VSAM.

VSI/CSRS APPLICATION DEVELOPERS – Experience with one or more of the following: REXX, SQL/DS, ISPF, and DIALOG MANAGER.

UNIX APPLICATION DEVELOPERS – Experience with device drivers, PS2/80, C.

At TSG, our focus is technical strength. If you want technical diversity and career growth, TSG wants to talk to you. We offer a competitive salary and company paid benefits including profit sharing. For confidential consideration, please send resume with salary history to: **Manager of Personnel.**

TSG

TECHNICAL SUPPORT GROUP, INC.
[illegible] S. Michigan Ave.
Suite 27[illegible]
Chicago, IL 60601
Equal Opportunity Employer

TELECOMMUNICATIONS MANAGER

Yellow Freight System, the Nations largest motor carrier, offers a unique opportunity to join a winner! We have a long and successful track record of growth and profitability. In the past 4 years we have doubled in size with annual revenues of $1.2 Billion, 885 locations and 26,000 employees.

We seek a Telecommunications Manager to take responsibility for total telecommunications services for the company's nationwide. This individual will manage a communications staff of 18 and $22 million in annual telecommunication expenses to ensure that telecommunications services are provided to the company in a timely, reliable and cost effective manner. Requirements include: Significant management or supervisory experience with professional/technical personnel; Previous experience in voice, radio or data communications (5 + years preferred); basic knowledge of accounting principles, including capital investment analysis and budgeting; and effective verbal/written communication skills.

This position is located at our corporate headquarters at Overland Park, KS, a progressive suburb of Kansas City. Yellow's outstanding salary and benefit package and professional work environment encourage growth and development of your skills. Qualified candidates are encouraged to send resume and salary history. In confidence, to Barbara J. Brown:

YELLOW FREIGHT SYSTEM, INC.
P.O. Box 7270
Overland Park, KS 66207
Equal Opportunity Employer

ADS/O IDMS ORACLE

Excellent Benefits
Salary $30-45K
Southeast Locations

800-874-9595

NPS
NATIONAL PROGRAMMING SERVICES, INC.
121 Executive Center Drive ☐ Suite 128
Columbia, South Carolina 29210

Aristokraft, Inc.
Senior Programmer Analyst

Aristokraft, Inc., one of the nation's leading manufacturers of quality kitchen and bath cabinetry, has an immediate opening for an experienced Senior Programmer Analyst. This position is located at our headquarters in Jasper, Indiana.

We are seeking a self-motivated, results oriented individual with a sharp business perspective and leadership skills. The successful candidate must have a B.S. degree in Computer Science or Business and 4-6 years programming experience using COBOL and CICS command level coding in an IBM/MVS mainframe environment. Additional experience with data base management systems (DLI, IMS, IDMS, or equivalent) is desired.

If you meet the above qualifications and desire an opportunity with a dynamic, growth oriented company that offers an excellent compensation package, send your resume and salary history to:

Aristokraft®
Attn: Employment Office
P.O. Box 420
Jasper, IN 47546
EOE

COMPUTER CAREERS NETWORK

Now you can recruit the best qualified computer and communications professionals regionally, nationally and weekly.

How?
With IDG Communications new Computer Careers Network. Choose from the Network's eight computer-related newspapers and tailor your recruitment message to the type of talented professionals you need to reach – professionals that read Computerworld, InfoWorld, Network World, Digital News, Federal Computer Week, and Computer Currents. Then, target your audience by region. Or blanket the entire nation.

Call your local sales representative today for more information about Computer Careers Network's regional, national and weekly reach.

Sales Offices
John Corrigan, Recruitment Advertising Sales Director, 375 Cochituate Road, Box 9171, Framingham, MA 01701-9171; 617-879-0700. BOSTON: 375 Cochituate Road, Box 9171, Framingham, MA 01701-9171; Al DeMilo, Regional Manager; Nancy Percival, Account Executive; 800-343-6474. In Massachusetts, 617-879-0700. NEW YORK: Paramus Plaza I, 140 Route 17 North, Paramus, NJ 07652; Warren Kalber, Regional Manager, 201-967-1390; Jay Horwick, Account Executive 800-343-6474. WASHINGTON, D.C.: 3022 Javier Road, Suite 210, Fairfax, VA 22031; Kasia Kress, Regional Manager, 703-573-4115; Pauline Smith, Account Executive 800-343-6474. CHICAGO: 10400 West Higgins Road, Suite 300, Rosemont, IL 60018; Pamela Powers, Regional Manager, 312-827-4433. Ellen Casey, Account Executive 800-343-6474. LOS ANGELES: 19004 Sky Park Circle, Ste. 100, Irvine, CA 92714; Barbara Murphy, Regional Manager, 714-250-0164; Chris Glenn, Account Executive, 800-343-6474. SAN FRANCISCO: 19004 Sky Park Circle, Ste. 100, Irvine, CA 92714; Barbara Murphy, Regional Manager, 714-250-0164; Chris Glenn, Account Executive, 800-343-6474.

PROGRAMMERS/ ANALYSTS

Due to a constant increase in demand for our services, a great number of consulting positions are available for experienced professionals. Individuals selected for these positions must be experienced with: COBOL, BAL, PL/1, or FORTRAN and some of the following:

DB2/SQL	IDMS/ADSO
IMS DB/DC	ADABAS/NATURAL
S/38 RPG III	UNIX "C"
CICS	HP 3000, IMAGE
HONEYWELL	MSA
ORACLE/SQL	UNISYS
APS	CP/CS

Current opportunities also exist for Systems Programmers and DBA's. For consideration please call or send your resume to:

Interactive Business Systems, Inc.
414/786-0220
206 Bishops Way ● Suite 206
Brookfield, WI 53005

APPLICATIONS DEVELOPMENT SYSTEMS PROFESSIONALS

Your Leadership Deserves A Broader Range of Projects

Consulting, with Ernst & Whinney Management Consulting Services, provides it. Significant growth, combined with considerable success in serving our clients, has resulted in immediate openings for experienced information systems professionals in our Midwest Consulting Offices.

Opportunities in Chicago, Indianapolis & Minneapolis

As a Manager or Senior Consultant in our Information Technology Group, you will assist clients with any and all aspects of their information systems needs: requirements planning; software and hardware selection, systems design and implementation; data security; user training; and more.

Ideal candidates will have a minimum of 5 years of major structured systems development experience in an IBM mainframe environment, using structured analysis and structured design techniques. Familiarity and/or experience with CASE technologies and systems development methodologies is highly desirable. Project management experience in task planning, estimating and controlling large projects is a plus. A 4 year college degree in computer science or equivalent is expected.

Ernst & Whinney Management Consulting Services — one of the premier organizations in the field — will provide you with a most competitive salary, benefits program, and relocation assistance. For consideration send your resume or letter of qualification to: Mr. Richard Getch, ERNST & WHINNEY, One Indiana Square, Suite 3400, Indianapolis, IN 46204. An Equal Opportunity Employer m/f/h/v.

Ernst & Whinney
And results. They go together.

Looking for qualified computer professionals?

Look no further. More than 612,000 computer-involved professionals read Computerworld every week. And you can reach all of them– or just the ones in your region -- with a regional or national recruitment ad in Computerworld's Computer Careers section.

For more information or to place your ad, call Lisa McGrath at 600-343-6474 (in MA, 617-879-0700).

MIS MANAGER

An international manufacturing firm headquartered in the midwest seeks an experienced MIS Department Manager. The ideal candidate will have a B.S. in Computer Science or related discipline, experience with IBM 38, RPG III and familiarity with IBM Series 1. Knowledge of the design and analysis of manufacturing, accounting and sales applications a must. Candidates must have a proven supervisory experience in a mid-size to large department. Send your resume with cover letter and salary history in absolute confidence to:

CW-85845
COMPUTERWORLD
Box 9171
Framingham, MA 01701

RESEARCH TRIANGLE OPPORTUNITIES

The Jonesboro Group

THE CAROLINAS! A Great Place to Live!

partial listing

VOICE/DATA MGR.	60K
S/A BPCS, MRP	40K
SR. P/A, IBM CICS	40K
P/A, IBM XA, COBOL	36K
TANDEM, PATHWAY	36K
S/A, IBM SYS/36, COBOL	30K
P/A, IBM SYS/36, RPG II	30K
P/A, IBM COBOL	27K

REGENCY
PERSONNEL CONSULTANTS
Randy Paul (919) 373-1001
P.O. 14995
Greensboro, N.C. 27415

Now... you can recruit the right people in the right places at the right price.

With the new IDG Communications Computer Careers Network, you can run the most targeted and cost-efficient recruitment program possible. You simply choose the combination of eight leading newspapers - Computerworld, InfoWorld, Network World, Digital News, Federal Computer Week, and Computer Currents/ Northern California, Southern California, and Boston editions - that's right for you.

For all the facts on putting the Computer Careers Network to work for you - regionally or nationally - call the sales office nearest you. Or contact John Corrigan, Recruitment Advertising Sales Director, at 617-879-0700.

Sales Offices: BOSTON: 375 Cochituate Road, Box 9171, Framingham, MA 01701-9171, (617) 879-0700; NEW YORK: Paramus Plaza I, 140 Route 17 North, Paramus, NJ 07652, (201) 967-1350; WASHINGTON: 3022 Javier Road, Suite 210, Fairfax, VA 22031, (703) 573-4115; CHICAGO: 10400 West Higgins Road, Suite 300, Rosemont, IL 60018, (312) 827-4433; LOS ANGELES: 18004 Sky Park Circle, Suite 100, Irvine, CA 92714, (714) 250-0164; SAN FRANCISCO: 18004 Sky Park Circle, Suite 100, Irvine, CA 92714, (714) 250-0164

IMMEDIATE OPPORTUNITIES IN DALLAS, TEXAS

the Federal Home Loan Bank has **immediate** openings in our Dallas office for the following positions:

TECHNICAL SUPPORT SENIOR ANALYST

This position is responsible for the operating system support for all system software products to ensure that the systems are maintained at current levels. Qualified candidates will meet the following requirements:

- Bachelor's degree in Computer Science or related field.
- 8+ years experience in data processing.
- Thorough knowledge of assembly level programming languages with working knowledge of Cobol.
- Proven Mainframe performance and tuning plus DASD management and tuning.

Respond to Station TS

PROGRAMMER/ANALYST

The principal responsibility is to maintain current computer programs and to assist in the development of new programs. Qualified candidates will meet the following requirements:

- Bachelor's degree in Computer Science: extensive programming experience will be considered in lieu of degree.
- Minimum 4 years experience in data processing.
- Proven Cobol, MVS and OS/JCL language skills.
- CICS and PC operation background preferred.
- MSA human resource or payroll programming experience strongly preferred.

Respond to Station PA

The FHLB of Dallas is a 16 Billion dollar institution providing extensive regulatory and correspondent banking services to a five state region. We offer an excellent benefit package and salary commensurate with experience. For consideration please submit your resume with salary history in confidence to:

Professional Recruiter
FEDERAL HOME LOAN BANK OF DALLAS
P.O. Box 619015 ● Dallas/Fort Worth, TX 75261-9015

Equal Opportunity Employer

No phone calls please — Principals only

FEDERAL HOME LOAN BANK OF DALLAS

Data Processing

ADR Data Base Administrator

This exceptional opportunity is offered by Ralston Purina, a leading international corporation. Our diverse structure and continued expansion call for highly sophisticated information systems and talented professionals to direct them. We currently have an opening for an ADR Data Base Administrator.

You will work closely with division application analysts in designing ADR/IDEAL data bases. Other responsibilities include providing technical leadership and support for applications and operations areas, implementing and maintaining systems, testing new software and peforming data base tuning.

To qualify, you must have a degree or equivalent experience, 3-5 years' application development or equivalent background and a minimum of 2 years' experience in data base administration using ADR products.

Put your technical skills to work for Ralston Purina Company. We offer an excellent salary and benefits package. To apply, send your resume to: Ralston Purina Company; Corporate Employee Relations; Department A-3; Checkerboard Square; St. Louis, MO 63164. An Equal Opportunity Employer.

Ralston Purina Company

"For Source Edp, Computerworld is a people-and profit-puller."

Dave Grinnell
Vice President & Ad Director
Source Services Corporation
Mountain View, CA

Dave Grinnell is Vice President and Advertising Director of Source Services Corporation, the parent company of Source Edp, the world's largest recruiting firm that specializes in the computer profession. Source Edp has been an advertiser in Computerworld — almost from inception of the publication. Here's why:

"With its fantastic pass-along circulation, Computerworld not only reaches executives in computer management, but programmers, systems analysts and other individual contributors that are in particular demand by our client firms. It helps us reach the heart of our candidate base efficiently."

"Not only does Computerworld reach our market, but it reaches a market that's actively interested in computing and fostering their career growth. Conservatively, over the years, we have helped many thousands of Computerworld readers find new positions within the computer profession; many times more than those readers of other technology or trade publications. How do we know? We have an elaborate tracking system that helps us verify from which media respondents see our ads. Typically, Computerworld generates over four times more respondents who eventually are placed in new positions by Source than the next nearest computer industry publication."

"Because we're national in scope, we need the coast-to-coast coverage and support that Computerworld offers our 75 office network. We've helped Computerworld readers find candidates or move from Houston to Rochester, NY. . . . from Seattle to Miami . . . you name it. That's something that local newspapers, local radio and other media we also use can't accomplish for us with as much direct success."

"In short, why do we depend on Computerworld? First, it's profitable reading for employers. Second, it's profitable reading for those seeking new employment. And third, through our services, it's also profitable reading for us. It's a 'win-win-win' situation for all."

Computerworld. We're helping employers, top professionals and people who help them get ahead get together. Every week. Just ask Dave.

For all the facts on how Computerworld can put you in touch with qualified personnel, call your local Computerworld Recruitment Advertising sales representative.

COMPUTERWORLD

Sales Offices:
BOSTON: 375 Cochituate Road, Box 9171, Framingham, MA 01701-9171, (617) 879-0700
NEW YORK: Paramus Plaza I, 140 Route 17 North, Paramus, NJ 07652, (201) 967-1350
WASHINGTON: 3022 Javier Road, Suite 210, Fairfax, VA 22031, (703) 573-4115
CHICAGO: 10400 West Higgins Road, Suite 300, Rosemont, IL 60018, (312) 827-4433
LOS ANGELES: 18004 Sky Park Circle, Suite 100, Irvine, CA 92714, (714) 250-0164
SAN FRANCISCO: 18004 Sky Park Circle, Suite 100, Irvine, CA 92714, (714) 250-0164

An IDG Communications Publication

With your experience in data processing and our access to better positions, isn't it time you met Robert Half?

There's one good way to make the most of your job experience in data processing. Combine it with ours!

Ever since the computer revolution began, our offices have been helping thousands of data processors find better jobs. Jobs with fine companies. Jobs that meet the requirements of the professional looking for a challenging future. And there's a good chance that we can even find the right job in the exact location you select—around the corner or around the world. You see, we've got 130 offices on three continents which gives you maximum exposure to what you want, and where you want it.

In data processing experience means everything. Yours and ours. Put it to work today by calling a nearby Robert Half office. You'll be glad you did.

ROBERT HALF®
DATA PROCESSING

*Founder of Robert Half International Inc. and author of "Making It Big In Data Processing," Crown Publishers (July 1987)

© 1987 Robert Half International Inc.

AT COMPAQ, A FIRST PLACE FINISH IS ONLY THE BEGINNING.

When you're setting the pace, you don't stop to rest.

Our people have taken us farther, faster than any company in history. Now Compaq is the industry leader in personal computers for business. In 1987 we became the fastest company to reach $1 billion in annual sales. And our sprint to the *Fortune 500* turned in a record time as well.

But getting out in front wasn't easy. And staying there is even tougher. It takes the careful planning and hard work of a team of talented professionals.

SOFTWARE QUALITY ASSURANCE ENGINEERS

Put your design and development expertise to the test improving structural software. You'll have a hand in increasing the reliability of personal computer systems and operating systems software. With a BSEE/BSCS and five years' software quality assurance or testing experience, the challenge is yours. Knowledge of "C" and 8086/286/386 Assembly language is essential.

APPLICATIONS ENGINEERS

Test third party software/hardware products to analyze the level of performance and compatibility of Compaq products. Use your investigative abilities to develop successful systems solutions. Your knowledge of the following is essential: communications, local area networks, computer graphics, CAD/CAE and desktop publishing. You'll need a BSCS, BSEE or equivalent degree with four years' experience in design, development or testing.

SYSTEMS ARCHITECTS

Design new products by investigating and evaluating system compatibility and performance of design alternatives and new technologies. You'll develop hardware compatibility tests and performance analysis tools.

Qualify with a BSEE, MSEE preferred, and three years' hardware background with a knowledge of microprocessor-based systems software. In addition, experience with CPUs/memory/bus architecture, numeric co-processors, file subsystems, network/communications, graphic subsystems and state machines is required.

AREA SALES SUPPORT ENGINEERS

With superior communication and presentation skills, you'll help support our clients and sales staffs in Houston, Dallas, Chicago, Detroit, St. Louis, Boston, New Jersey, Orlando, Washington, D.C., and Lake Success, New York.

You'll need a BS or BA in Engineering, Computer Science or related field. In addition, you must have three years' experience in microsystems application and operations with expertise in micro-to-mainframe communications, multi-user systems software, multi-tasking environments, networking, and hardware for graphics, microprocessors and PCs.

SYSTEMS SUPPORT ANALYSTS

You'll put third party software/hardware products to the test to analyze Compaq products' level of compatibility and ensure compliance with industry standards. Your technical support and trend monitoring of new third party products put you on the forefront of systems development. You'll need four years' related experience in the microcomputer industry and a thorough knowledge of systems software, operating systems, languages and third party products.

SYSTEMS SOFTWARE ENGINEERS

Evaluate, design and develop firmware, operating systems, device drivers and utility software for PC systems. You'll need a BSCS, BSEE or equivalent degree with four years' related experience in PC software development, 8086/286/386 Assembly/"C" language programming in MS-DOS, OS/2 and/or UNIX/XENIX operating system environments.

Compaq offers competitive salaries, comprehensive benefits and an environment that supports creativity, open communication and team involvement. To find out more about joining the Compaq team submit your resume, salary history and the position for which you wish to be considered to: Compaq Computer Corporation, Dept. CW425-YA, P.O. Box 692000, Houston, Texas 77269-2000. Compaq is an affirmative action employer, m/f/h/v.

COMPAQ®

SYSTEMS ANALYST

Major University seeks Computer Systems Analyst to support user community on programming languages, database management systems, operating system utilities, supercomputer systems, text formatting systems, graphics, utilization of high tech computer peripheral devices and develop database applications using RIM-5 database management systems. Requires BS in Computer Science plus 1 yr exp. in computer programming and systems analysis including FORTRAN, COBOL, BASIC, LISP, & PASCAL comp. programming languages; VAX/VMS systems; database management systems; comp. graphics; word-processing & text manipulation software. Salary: $26,300 per/yr. Contact: B. Jo Lyell.

Tennessee Department of Employment Security
C1-114 Cordell Hull Building
Nashville, TN 37219

PROGRAMMER ANALYST

At SGS-Thomson Microelectronics, you can become part of our semiconductor team. We're offering exceptional career opportunities to highly motivated professionals.

This position offers an opportunity to fill a key role in MIS Applications Development providing support to manufacturing, engineering and related organizations.

Responsibilities will include working with above organizations to determine needs and requirements in addition to performing systems analysis, program design, programming and implementation tasks.

A DEC VAX cluster (8650 and 8700), networked world-wide, is utilized to maintain a comprehensive integrated manufacturing control system which tracks and monitors all site manufacturing activities real-time.

Future development will focus on programs which support manufacturing's increased productivity goals. Primary emphasis will be in line scheduling, statistical process control and process automation programs.

Requirements: Must have degree in Computer Science or related field. 1-3 years of DEC VAX experience with COBOL is required. VAX DBMS 32 and FMS are desirable. Experience with data analysis tools and/or understanding of basic statistics is also desirable.

Remarks: SGS-Thomson Microelectronics offers excellent opportunity for growth and development, along with an excellent compensation and benefits package. For confidential consideration, send resume to:

SGS-Thomson Microelectronics
Employment Manager
Department 8611
1310 Electronics Drive; MS 776
Carrollton, Texas 75006

SGS-THOMSON MICROELECTRONICS

Principals only, please
An equal opportunity employer, m/f/h/v

FLORIDA

Pragr/Analyst
$40,000

Fortune listed Corp. seeks min 5 yrs exp in MVS, COBOL & IMS DB/DC. Purchasing and Fleet applications. Associate Degree or better.

Russell Warner Associates
2203 North Lois Ave.
Suite 100
Tampa, FL 33607
(813) 879-[illegible]

VP ENGINEERING AND RESEARCH

Computer systems/software firm in So. Cal. seeks engineering & research expert for product development, engineering & technical staff. Need 10 yrs. experience, knowledge of DEC. Need EE or computer science degree. Excellent salary & benefits. Send resume in confidence to: CW-B6047, Computerworld, Box 9171, Framingham, MA 01701-9171

ACP/TPF PROFESSIONALS

Experienced ACP/TPF Project Leaders and Systems Analysts needed immediately for an exciting new international project located in the Midwestern US.

These positions command top salaries and an excellent benefit package, including flight benefits. Many of these positions will lead to overseas assignments. Call today or rush your resume to:

SYSTEK
1[illegible] Marshfield Dr.
Department CW 44
Tampa, FL 33634
(813) 264-[illegible]

SYSTEK, the ACP/TPF recruitment specialists.

UNIVERSITY OF HOUSTON-CLEAR LAKE

ASSOCIATE DIRECTOR FOR SYSTEMS DEVELOPMENT & SUPPORT

The University of Houston-Clear Lake is seeking qualified applicants for the position of Associate Director for Systems Development and Support.

Duties and Responsibilities: ● Manage the software development and support function. ● Make personal technical contributions to the software development and support effort. ● Possess strong hands-on technical skills in software development and support for comprehensive state-of-the-art administrative systems running in a VAX environment.

Minimum Requirements: ● Bachelor's degree in computer science, math, information systems or a related engineering field. ● Two years hands-on, comprehensive experience in the development and support of major administrative software under state-of-the-art data base management system. ● One year experience must be in a VAX VMS environment in the scale of 11/780 or higher. ● Master's degree, as specified above, and Oracle data base development experience preferred.

Salary: Mid 40's, commensurate with skill level and qualifications.

Closing date for applications is May 20, 1988.

Submit letter of application and current resume to:

Search Committee Chairperson
for Associate Director for Systems Development & Support
University of Houston-Clear Lake
2700 Bay Area Boulevard, Box 230
Houston, Texas 77058

An Equal Opportunity, Affirmative Action Employer

The University recognizes that minority and racial diversity increases the quality of our faculty and student body.

RSVP SERVICES

• ANALYSTS • PROGRAMMERS
SOFTWARE/HARDWARE

Multiply Your Opportunities

With a network of over 1000 client companies and 200 affiliate employment agents nationwide RSVP can selectively communicate your credentials to companies offering literally hundreds of choice current career opportunities clear across the nation.

We guide, You decide

Our no-obligation, no-pressure employment services to degreed, experienced U.S. citizens and permanent residents include resume development and interview arrangement.

If you qualify, call Howard Levin or Maureen McCue at 800-222-0153 or (in NJ) 609-667-4488 or send your resume to either address listed below. Our client companies pay all costs.

RSVP SERVICES

One Cherry Hill Mall, Ste. 614, Dept. C, Cherry Hill, NJ 08002

Dublin Hall, Suite 201, Dept. C, 1777 Walton Rd., Blue Bell, PA 19422 *(Mail address only)*

Member Firm
computer/net
national placement network

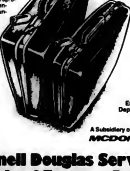
APPLICATIONS PROGRAMMER/SAUDI ARABIA

PACK YOUR BAGS

If you look beyond ordinary possibilities for maximizing your strong capabilities in program analysis and design, you can find a special opportunity with extraordinary rewards. This opportunity has been selectively developed by McDonnell Douglas Services, whose operations in Saudi Arabia for the Peace Sun Program include training and maintenance support for the F-15 Eagle aircraft.

We've listed major advantages accompanying this opening. Together these advantages represent the chance for you and your family to enjoy the experience of life in a hospitable country with a unique culture, to travel to other countries, pursue work you find most satisfying and receive the kind of compensation for your contribution that is seldom provided.

- **Attractive base pay, foreign service additive, cost of living allowance, completion award**
- **Free, furnished housing and paid utilities**
- **Company provided recreational facilities**
- **Local transportation at no cost**
- **Comprehensive relocation program**
- **Generous home/vacation leaves**
- **Group insurance, savings and retirement plans, as well as other optional benefits.**



We would rely on your ability to resourcefully address complex program problems and design and implement accurate, reliable and efficient structured computer programs. This position also entails modifying and maintaining existing programs and assisting in conducting cost and feasibility studies. At least 7 years of experience in COBOL, TSO and IMS in an MVS environment, including 2 or more years of experience in program analysis and design, are required. A bachelor's degree, preferably in computer science or in data processing, mathematics, engineering or statistics or equivalent experience is a requisite.

If you wish to know more of the world and want more from it, please call collect, from anywhere in the Continental United States to ED JAMES (314) 429-9252 from 7:00AM to 3:00PM Central Standard Time.

If you are unable to call, send your resume to: **McDonnell Douglas Services, Inc., Professional Employment PO62/E73, P.O. Box 516, Dept. W-006, St. Louis, Missouri 63166.**

An Equal Opportunity Employer
U.S. Citizenship Required

A Subsidiary of
MCDONNELL DOUGLAS

And let McDonnell Douglas Services take you to the crossroads of Europe, Asia and Africa.

EDP PROGRAMMER, BUSINESS APPLICATIONS: Develop, test, and implement application software used for the support of the Corporate Division and corporate wide systems used by multiple operating units.

Development procedures include COBOL, IMS DB/DC, COBOL, CICS, and FOCUS batch and interactive on MVS and VM operating systems. Requires B.S. degree in Computer Science. Must be on-call 24 hours a day, two days per week, to provide technical support in case of computer malfunction. Hours: 8:00 a.m. - 5:00 p.m. 40 hours per week at $1,[illegible] per month salary. Please send resume to: Illinois Department of Employment Security, 7[illegible] North Kilburn Avenue, Rockford, Illinois 61108, Attention: Carole Schluge, Reference #[illegible]-H, AN EMPLOYER PAID AD.

Project Leader/Computer systems Analyst wanted for project control, systems analysis, design, specification and program development for application systems in a distributed data processing environment using software tools like PROTEUS on Burrough microcomputers including B-20 series, XE-500 series and on B1000/A series mainframes, primarily in PASCAL. Integration with LINC based mainframe applications; Requires Bachelor's degree in Mathematics or Computer Science, two years experience in job offered or two years related experience as a Senior Computer Systems Analyst. Experience must include two years software development on Burroughs mainframes and microcomputers; $40,000.00 per year. 40 hours per week. Send resume to 7310 Woodward Ave., Room 415, Detroit, MI 48202. Ref. #24788. "Employer Paid Ad."

East Coast, West Coast, and Midwest Offices

National Contract Opportunities

COBOL **C**
Assembler **Basic**
PL1 **RPG**

Mainframe, Minis, & Micros
Databases, 4th GLs, & LANs
Call or send resume to
214-490-1966

Sue Latham
12700 Park Central Drive,
Suite 1501
Dallas, TX 75251

PROGRAMMER/ANALYST SYSTEM 38

General Time Corporation, a manufacturer of Westclox and Seth Thomas products is seeking a Programmer/Analyst. Applicants should have 3-4 years RPGIII experience in a manufacturing environment. PCR experience is a definite plus.

The selected candidate will work out of our Atlanta suburb location in an attractive and progressive environment.

We offer a competitive salary and benefits package. For prompt and confidential consideration, send your resume with salary history to:

GENERAL TIME CORPORATION
Human Resources Department
P.O. Box 4125
Norcross, GA 30091-4125

EOE M/F

SYS/36 - CALIF.

Santa Barbara Cottage Hospital, a 400-bed acute care facility, has an immediate opening for a Programmer/Analyst in our progressive in-house MIS Dept. Applicant must have a good working knowledge of System 36 and RPG II. PC background helpful, technical expertise must be matched by people skills. Salary commensurate with experience. Benefits are excellent. Our hospital is located on the coast, 100 miles north of Los Angeles. If interested please send resume and salary requirements to:

Human Resources Dept.
[illegible] Bath St.
Santa Barbara, CA 93105
(805) [illegible]-7213, EOE.

PROGRAMMER/ANALYST (NYC): Design, program, analyze and enhance accounting, billing, sales and inventory control systems utilizing IBM systems 34 and 36, RPG II, SEU and DFU. BSC in computer science plus 1 years experience or related experience or 4 years experience in systems analysis or programming without degree. $29,100 per year. 37.5 hrs/wk. Resume or letter only in duplicate, to: PAM #154, Room 501, One Main Street, Brooklyn, NY 11201.

UNIVERSITY OF HOUSTON-CLEAR LAKE
ASSISTANT DIRECTOR FOR COMPUTER OPERATIONS

The University of Houston-Clear Lake is seeking qualified applicants for the position of Assistant Director for Operations.

Duties and Responsibilities: ● Assume responsibility for the full scope management of Computer Operations. ● Manage the computer operations function and make personal technical contributions in this effort. ● Provide direct interface with the user community to ensure that production computing requirements for administration and academic computing are met. ● Supervise computer operations, set the production schedule for all computer systems, support the software development effort and maintain consistent communications with all user communities. ● Oversee system back-up, security, disaster recovery and general stability of the computer systems.

Minimum Requirements: ● Progress toward a bachelor's degree in computer science, engineering or information systems. ● One year hands-on comprehensive experience in managing a computer operations function with HP3000/[illegible], VAX 11/780, IBM 4341 or higher level system. ● A bachelor's degree, as specified above, and data base experience preferred.

Salary: Mid to high 20's, dependent on skill level and qualifications.

Closing date for applications is May 30, 1988.

Submit letter of application and current resume to:

Chairperson for Assistant Director for Computer Operations
University of Houston-Clear Lake
2700 Bay Area Boulevard, Box 230
Houston, Texas 77058

An Equal Opportunity, Affirmative Action Employer

The University recognizes that minority and racial diversity increases the quality of our faculty and student body

RPGIII PROGRAMMING INSTRUCTOR

J.D. Edwards & Company, a leader in developing accounting based software for the IBM S/38 is searching for a RPGIII Programming Instructor. The duties of this position will involve teaching classes and managing the laboratory for students.

The ideal candidate for this position will have a minimum of 2 years of experience with RPGIII on the S/38 and possess hands-on experience with curriculum development and teaching in the classroom environment. Strong communication and organizational skills are also required.

J.D. Edwards & Company offers outstanding compensation, benefits, and relocation packages. For prompt and confidential consideration, please send your resume and salary requirements to:

Personnel Manager
J.D. Edwards & Company
4949 South Syracuse Street
Denver, CO 80237

An EOE employer. No phone calls or agencies, please.

SENIOR SYSTEMS PROGRAMMER to supervise the high level design, development & testing of a system for receiving retail merchandise to promote more effective operations. Lead & coordinate activities of a group of Programmers using PL1, APS, BAL, & VSAM (access method). Requires accountability in such areas as: order data, receiving processes, & inventory. Investigate other systems (which have material handling segments) to determine applicability in the retail receiving system & coordinate activities relating to the interface. Responsible for continued optimization & enhancing of existing systems. Work with IBM series one (minicomputer), IBM mainframe & online CICS & APS. Requires High School Ed. and 3 Yrs. direct exp. or 3 Yrs. related exp. as a Programmer/Analyst. Related exp. must have included supervision of Programmers using: PL1, BAL, & VSAM as well as working with minicomputer, mainframe & online CICS. Salary $3,318 Per Month, 40 Hrs. P.W., 8-5, M-F. Send resume to: Illinois Department of Employment Security, 401 S. State St., 3rd Floor South, Chicago, IL 60605, Att: Mrs. S. Chalem, Ref #7983-S. An Employer Paid Ad.

PROGRAMMER/ANALYSTS

Immediate opportunities exist to join the southeast's most dynamic consulting firm. Excellent salary and benefits package. Current openings include:

- NATURAL/ADABAS
- System 38/RPG ●
- IDMS/ADS/O
- HP 3000/COBOL
- HP 3000/TRANSACT
- COBOL/CICS
- VAX/COBOL
- VAX/FORTRAN/health physics
- VAX/RDB

For further information please call or write:

COMPUTER CONSULTING GROUP
One [illegible] Blvd.
Columbia, SC 29[illegible]
1/800/222-1273 or
803/[illegible]-1[illegible]
ATTN: [illegible] Murphy or Jack Claypoole

COMPUTER CAREERS NETWORK

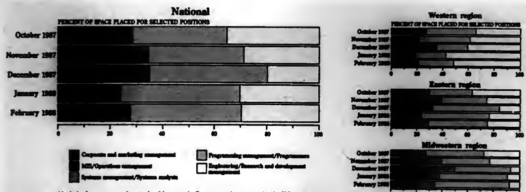
Now you can recruit the best qualified computer and communications professionals regionally, nationally and weekly.

How? With IDG Communications new Computer Careers Network. Choose from the Network's eight computer-related newspapers and tailor your recruitment message to the type of talented professionals you need to reach – professionals that read Computerworld, InfoWorld, Network World, Digital News, Federal Computer Week, and Computer Currents. Then, target your audience by region. Or blanket the entire nation.

Sales Offices: John Corrigan, Recruitment Advertising Sales Director, 617-879-0700. BOSTON: Al Debille, Regional Manager, Nancy Percival, Account Executive, 800-343-6474, (in Massachusetts, 617-879-0700). NEW YORK: Warren Kaltser, Regional Manager, 201-967-1350; Jay Novack, Account Executive 800-343-6474. WASHINGTON, D.C.: Katie Kress, Regional Manager, 703-573-4115; Pauline Smith, Account Executive 800-343-6474. CHICAGO: Patricia Powers, Regional Manager, 312-827-4433, Ellen Casey, Account Executive 800-343-6474. LOS ANGELES: Barbara Murphy, Regional Manager, 714-250-0164, Chris Glenn, Account Executive, 800-343-6474. SAN FRANCISCO: Barbara Murphy, Regional Manager, 714-250-0164; Chris Glenn, Account Executive, 800-343-6474.

CAREER INDEX

Computer recruitment advertising activity*



*Analysis of computer recruitment advertising space in *Computerworld* and selected major U.S. newspapers

INFORMATION PROVIDED BY CW PUBLISHING, INC.'S RECRUITMENT MARKET RESEARCH DATA BASE
CW CHART

Invisible hand pushing IBM?

Market shows clear preference for older technology, but reason unclear

BY CAMERON HALL
BOSTON COMPUTER EXCHANGE CORP.

In s month during which the Boston Computer Exchange Big Board closed on April Fool's Day and April 15, some interesting percentages emerged from the secondary computer market.

Just as the U.S. government collects its revenue as a percentage of income, most computer resellers sell as s percentage of list price. The rule of thumb is that discounts for new equipment range from zero to 30%; for used equipment, the average discount ranges from 35% to 55%. Used equipment also sells for 10% to 20% less than identical or comparable new equipment, and s buyer will also generally prefer the latest technology over earlier models.

Observing the IBM market, one can see that these rules do not apply to the recently discontinued IBM Personal Computer AT Model 339 and the current technology, the Personal System/2. One look at advertised prices shows the PS/2 selling at steep discounts of up to 43% with many retailers saying, "I'll sell as low as 48% if I need to. I've got to keep my volume up to get the discounts." In contrast, the discount on s used PC AT 339 was only 28% below the retail price of $5,120 — when it was discontinued.

If the PC AT 339 and the PS/2 Model 60 are "substitutable goods," then our rule of thumb should have s used AT selling 10% to 20% below the new Model 60. The BoCoEx Index shows this is not the case.

> A COMPUTER is not a house, to be kept forever.

Used ATs are selling for $3,700, while the advertised price for the new PS/2 Model 60 is as low as $3,160.

If you consider that the larger storage capacity, greater speed and improved graphics make the PS/2 an enhanced good, then this contrast is even more striking. The market is showing s clear preference for the older technology. Is this s separate market, or is the "invisible hand" forcing IBM's hand?

The most recent and most popular IBM PC XT and AT models closed up during the week ended April 15. The PC XT Model 089 was up $25 to $1,700, and large leasing companies were the most frequent buyers of the machine. PS/2 models experienced sluggish trading under good supply conditions. Early XT and AT models traded st the previous week's prices, and the IBM PC was up $25 in active trading.

Discounting takes toll

The Apple Computer, Inc. market held steady during the week after s drop in prices compared with recent weeks. Used Macintosh Plus prices were down $25 under pressure from heavy discounting at the retail level. Macintosh SE and Mac II models remained at the previous week's closing prices. The Macintosh IIE closed at $725, remaining popular with buyers and showing constant market demand.

The Compaq Computer Corp. Portable II and III models were popular all week, with the Portable II down $50 to $2,150 with good volume. The Portable Plus suffered as buyers passed up the 10-MHz hard disks for smaller laptops with 10-MHz or larger hard disks. The Deskpro 386 model continued to be the preferred machine for those upgrading from the 286 models.

Buyers and sellers are reminded that for taxes, price/performance or simple cash value, computers should be purchased with s clear idea that they will eventually be sold. A computer is not s house, to be kept forever. There will come s day when s return is maximized on the investment, and this should be calculated into what one buys and when one sells.

The Boston Computer Exchange can be reached at 800-BOCOEXX or 617-542-4414 in Massachusetts.

The BoCoEx Index

Closing prices report for the week ending April 15, 1988

	Closing price	Recent high	Recent low
IBM PC Model 076	$825	$900	$600
XT Model 086	$1,225	$1,350	$950
XT Model 089	$1,700	$1,700	$1,175
AT Model 099	$2,400	$2,450	$1,950
AT Model 239	$2,750	$2,750	$2,200
AT Model 339	$3,700	$3,850	$2,900
PS/2 Model 50	$2,475	$2,650	$2,400
PS/2 Model 60	$2,650	$2,800	$2,475
Compaq Portable I	$800	$825	$800
Portable II	$2,150	$2,225	$1,850
Portable III	$2,700	$2,750	$2,375
Plus	$1,175	$1,275	$850
Deskpro Model 2	$1,500	$1,600	$1,250
Deskpro 286	$2,425	$2,475	$1,975
Deskpro 386	$4,075	$4,000	$3,475
Apple Macintosh 512	$650	$750	$650
512E	$850	$1,075	$725
Plus	$1,150	$1,350	$950
SE	$1,925	$2,200	$1,600
SE 20 MHz	$2,400	$2,400	$2,100
II	$3,800	$4,200	$3,250
AT&T 3B2	$4,300	$4,900	$3,500
Apple Laserwriter Plus	$3,100	$3,500	$2,500
Hewlett-Packard Laserjet	$900	$900	$875

INFORMATION PROVIDED BY THE BOSTON COMPUTER EXCHANGE CORP.

Declines plague used IBM terminal market

BY CINDY SANTISARIO
IDC FINANCIAL SERVICES CORP.

The IBM 3178 display family has fallen dramatically on the used market since the beginning of the year. Current IDC Financial Services Corp. secondary market quotes indicate retail values have dropped approximately 18% since January.

This pronounced decline in the 3178's used market value is the result of the expiration of three-year leases during late fourth-quarter 1987 and early first-quarter 1988. As s result, end users have begun to dump their 3178 monochrome displays into the secondary market. Thus, used market prices for IBM's entry-level display family have fallen dramatically.

IDC Financial Services says values for the 3178 family of displays will continue to decline throughout this year. However, the company says it does not expect prices to fall as quickly as they have during the previous four months.

Like the 3178 family, the secondary market value for the 3180 Model 100/110 has dropped significantly since the start of the year; in fact, the Model 100/110's used value has fallen approximately $300 since January.

Reasons for decline

According to third-party market dealers, the recent fall in the 3180 Model 100/110 used market may be attributed to the following three factors:

- The 3192 Model D replacement product.
- The expiration of three-year leases.
- Aggressive third-party market pricing.

IBM terminal products

Current retail fair market value

	Date shipped	IBM list price	Percent of list price
3179 Model 1	1Q 1984	$2,095	31%
Model 200	4Q 1985	$1,335	86%

* Not available

INFORMATION PROVIDED BY IDC FINANCIAL SERVICES CORP.
CW CHART

According to experts, each of these three factors contributed to the significant loss in value of the Model 100/110 during the past four months.

The 3179 Model 1 used market has taken s nosedive as of late. Current market quotes indicate the 3179 has fallen approximately 18%, or $240, in three months.

IDC Financial Services says it expects this deterioration in used value to last as end users continue to swap their older 3179 Model 1 color terminals for the 3192 Model C replacement display.

In general, twinaxial terminals' used values do not drop as quickly as coaxial terminals on the secondary market.

For example, the 3180 Model 200 twinaxial terminal has not yet fallen as quickly as its counterpart, the 3180 Model 100. IDC Financial Services' April fair market values indicate s 9%, or $90, drop in 3180 Model 200 secondary market value since January as compared with s $300 fall in 3180 Model 1 used prices in that same period of time.

Long drop

IDC Financial Services says it expects this decline in the 3180 Model 200 to persist as users continue to dump their older Model 200s into the secondary market and replace them with 3197 Model Ds.

Contrary to the 3179 Model 1's used market, which has dropped 18% since the start of the year, the twinaxial 3179 Model 2 has experienced only minimal decline during the past few months. For example, IDC Financial Services' April fair market values show the 3179 Model 2 trading used for $1,160 retail, down only 4% since January.

For more information, contact IDC Financial Services Corp.'s Terri LeBlanc st 617-872-8200.

Used Equipment

We've Got You Covered

Small To Mid-Size Systems

- S/36, S/38, 9370, SILVERLAKE
- All Upgrades & Peripherals
- Customized Leasing Packages
- Lease, Buy, Or Sell
- Immediate Delivery
- Buy-Back Program
- Equipment Refurbished & Maintenance Guaranteed
- Technical Systems Support
- Distributor For Memorex, LOCOM, & EMC²

NEPTUNE
MARSHALL LEWIS DIVISION

For Small To Mid-Size Systems Call
1-800-426-8733 (714) 641-0366 (In CA)

Large Systems

- 4381, 308X, 3090
- Non-IBM (Amdahl, NAS & More)
- Peripherals & Communication Equipment
- Customized Leasing Packages
- Mid-Lease CPU & DASD Upgrades
- Lease, Buy, Or Sell
- Immediate Delivery
- Equipment Refurbished & Maintenance Guaranteed

NEPTUNE
For Large Systems Call (203) 356-9282!

IBM, Memorex, LOCOM, & EMC² are registered trademarks of International Business Machines Corporation, Memorex Corporation, LOCOM Corporation and EMC² Corporation respectively

---

DEC PDP-11
SYSTEMS & PERIPHERALS
BUY & SELL

THE One-Stop EXCHANGE!
- CPUS • TERMINALS
- DISC DRIVES • PRINTERS
- INTERFACES, ETC.

DIGITAL COMPUTER EXCHANGE INC
27771 Industrial Blvd., Hayward, CA 94545
FAX (415) 887-3100 TLX 755000

Call (415) 887-3100

---

55 PAGE
4381
ANALYSIS

FREE
TO IBM USERS

marketex
SALES AND SUPPORT
800 426-4381
CA 408 241-3677

IBM BUY · SELL · LEASE

36 · 38 · 4300 · SERIES 1

WHY

WHY SHOULD YOU LEASE?
WHY SHOULD YOU BUY?
WHY SHOULD YOU SELL?
WHY SHOULD YOU TRADE?
WHY SHOULD YOU UPGRADE?

WHEN YOU WANT ANSWERS,
CALL: 800-238-6405
IN TN: 901-372-2622

WE BUY - SELL - LEASE
34 - 36 - 38 SERIES 1
4331 - 4381
ALL PERIPHERAL EQUIPMENT
ALL UPGRADES

CB
COMPUTER BROKERS INC.
2978 SHELBY ST.
MEMPHIS, TN 38134
"SINCE 1974"

Member American Society Of Computer Dealers

FOR SALE
(10) RA81-EA Disk Drives (used)
• DEC maintained •
• Immediate availability •
Ziff-Davis Technical Information Co.
90 Blanchard Road
Burlington, MA 01803
Contact: Trish MacDonald
(617) 273-6500

We Buy & Sell
DEC
Systems Components
Digital Computer Resale
call:713 445-0082
600 Kenrick Ste C22
Houston, Tx 77060

BUY • SELL • SAVE'S
IBM DISPLAYWRITERS REPAIRS
IBM 1525 Systems

HONEYWELL
DPS/6 LEVEL 6 USERS
Contact your C.D. Systems marketing representative for details
READY FOR IMMEDIATE DELIVERY
DPS 6 PLUS Model 400, 2MB Main Memory, SMF, MLX-16, 4 RS-422-A Ports
2MB Memory Pacs
8MB to 16MB Memory Expansion
MXBC-16F Fixed Disk Controller
295MB Fixed Disk in Cabinet
¼" Table Top 64MB Cartridge Tape Unit
¼" Cartridge Tape Adapter
HVS 6 PLUS Operating System

CD systems inc.
THE COMPUTER PEOPLE
14614 Grover • Suite 200 • Omaha, NE 68144
(402) 330-2310

IBM BUY • SELL • LEASE
SERIES - 1
S/23 - 34
36 - 38
POS - BANKING
PARTS
AMCOM CORPORATION
800-328-7723
612-829-7445
5555 WEST 78TH STREET
MINNEAPOLIS, MN 55435

SALE OR LEASE
IBM CPU's

3084 - Q64	NOW
3090 - 150	3/1/88
3081 - GX2	NOW

Call:
GTEX Financial Group
(214) 783-1212

SHOP in...
Computerworld's
MARKETPLACE
Call for details!
(617) 620-7784 (617) 620-7758
(617) 620-7759 (201) 967-1358

Used Equipment

WE BOUGHT IBM

By the thousands.

And we still do. Computer Marketplace has bought thousands of IBM Series 1, S 3X, 43XX, 30XX, disc and tape drives, printers and other peripherals and we are very interested in offering you top dollar for yours.

We also deal in telecommunications equipment such as multiplexors, modems and port selectors.

Or if you have a need to buy, call us first and **BUY DIRECT** from the ...

COMPUTER™ MARKETPLACE

800-858-1144

In California, dial (714) 735-2102
205 East 5th Street, Corona, CA 91719

asci
CDLR

IBM IS A REGISTERED TRADEMARK OF INTERNATIONAL BUSINESS MACHINES, INC.

Get the Fax.

digital

FOR SALE!

865 XBAE DEC NET VMS IMMEDIATE DELIVERY $429,500	SA 482 NEW $61,000
VT241-AA VT24K-AA NEW $1,850	VT320-CA NEW $470
DHU11-M CK-DHU11 $3050	8500, 8700 SERIES F1007 DECODER MODULE NEW $29,495

dda
DIGITAL DEALERS ASSOCIATION

Merida
Trading Group

4C Gill Street
Woburn, MA 01801

Merida...
service is our strongest suit!

(617) 933-6790
FAX 617-933-7884

Digital and DEC are registered trademarks of Digital Equipment Corp.

BUY OR SELL NEW OR USED

IBM PC * XT * AT * PS/2
COMPAQ * HP * AT&T * WANG
MACINTOSH * APPLE 2

1-800-262-6399

Boston Computer Exchange Corporation
MA 617-542-4414
FAX 617-542-8849

WANTED

OBSOLETE COMPUTER EQUIPMENT

Top Cash Paid

We purchase all types of obsolete or excess computer equipment and peripherals. We pay costs for all shipments as well as top prices.

Call today for a quote on your system.

COMPU-SCRAP, Inc.
Randolph, MA 02368
(617) 341-2695
Call Collect!

IBM SPECIALISTS

800 251 26 0

CMA
COMPUTER MARKETING

PO BOX 71 • 610 BRYAN STREET • OLD HICKORY, TENNESSEE 37138

4341 - 4381

Buy - Sell - Lease
Trade-in

Systems and Peripherals

Hawkes Bay Computer
(408) 866-1020

DEC VAX & PDP 11

BUY-SELL-NEW-USED

Systems, Peripherals, Options available for sale

Looking to purchase VAX and PDP 11 Systems, Hardware

LAKEWOOD COMPUTER CORP.
426 Link Lane
Ft. Collins, CO 80524
(303) 493-6406 FAX: (303) 493-6406

dda

Used Equipment

IBM 4300 SERIES 1 SYSTEM 38 SYSTEM 36

MEMBER OF CDLA

• SPECIAL New S/36 Models D2K, D2L, D2M & 358 MB Disk Upgrades
• Buy • Sell • Lease • Trade • New • Used
• IBM Warranty/IBM Maintenance Guaranteed
• Disk • Terminals
• Flexible Lease Options Tailored to Your Needs
• Printers • Tape

MEMBER OF WAEL

• Equipment Configured To Your Requirements
• All CPU Upgrades

714/770-2122
2 Faraday
Irvine CA 92718

WANG
PRIME
MICRODATA
HONEYWELL
HEWLETT-PACKARD

CRC

BUY, SELL, LEASE, TRADE

23950 Commerce Park, Beachwood, Ohio 44122
(216) 292-0635 Fax: 216-292-4838 Telex: 205129

CRC is a Trademark of Computer Remarketing Corporations

IBM...36, 38, 4300, 30XX

• BUY
• SELL
• LEASE

UPGRADES
PRINTERS
CONTROLLERS
TAPES
DISKS
TERMINALS
FEATURES

800
258-2233

INTERNATIONAL COMPUTER SALES INC. • 1 E 1ST SUITE A • TUSTIN CA 92680

IF YOU'RE BUYING, WE'RE SELLING

IF YOU'RE SELLING, WE'RE BUYING

IBM SYSTEMS
Buy • Sell • Lease PERIPHERALS

(800) 331-8283
TOLL FREE

(213) 306-9343
CALIFORNIA

Ocean Computers, Inc.
8055 W. Manchester Ave., Ste 525
Playa Del Rey, CA 90293

HP 3000

7933H

Available in Quantity

Processors • Peripherals
Systems

All In Stock - Immediate Delivery

All warranted to qualify for manufacturer's maintenance

BUY • SELL • TRADE
RENT • LEASE

ConAm Corporation

It's Performance That Counts!
800/643-4954 213/829-2277

PRIME

EXPERIENCED SYSTEMS AND PERIPHERALS

BUY-SELL-LEASE-BROKERAGE

NEW PLUG-COMPATIBLE DISK, TAPE, MEMORY

PLUS
THE FASTEST I/O AVAILABLE ANYWHERE

1ST SOLUTIONS, INC
11400 N CAVE CREEK ROAD
PHOENIX, AZ 85020
602-997-0997
ASK FOR DON SHIFRIS

S/38 S/36
S/34
SERIES 1

BUY - SELL
LEASE

Systems, Peripherals
Upgrades

Source Data Products Inc.
800 Menlo Avenue # 200
Menlo Park, CA 94025
800/328-2669
415/326-7333

HONEYWELL

BCS

MISSISSIPPI CENTRAL
DATA PROCESSING AUTHORITY

Sealed proposals will be received by the CDPA, 301 N. Lamar St., 301 Building, Suite 500, Jackson, MS 39201 for the following equipment and services:

Request for Proposal No. 1338, due Monday May 9, 1988 at 3:30 p.m. for the acquisition of an upgrade to the graphics local area network in the Electrical Engineering Department at MISSISSIPPI STATE UNIVERSITY. This acquisition will include server, workstations, and peripherals. No charge.

Request for Proposal No. 1341, due Wednesday, May 11, 1988 at 3:30 p.m. for the upgrade of a Silicon Graphics IRIS-3020 workstation for the UNIVERSITY OF MISSISSIPPI. No charge.

Request for Proposal No. 1342, due Monday, May 9, 1988 at 3:30 p.m. for the acquisition of maintenance on microcomputer equipment and peripherals for the Procurement Division of the CENTRAL DATA PROCESSING AUTHORITY. No charge.

Request for Proposal No. 1343, due Tuesday, May 10, 1988 at 3:30 p.m. for the acquisition of a high speed optical mark reader for the MISSISSIPPI STATE DEPARTMENT OF EDUCATION. No charge.

Request for Proposal No. 1344, due Friday, May 13, 1988 at 3:30 p.m. for the acquisition of a fourth generation program development and report writer package to run on an IBM S/36 for the Administration and Support Services Department at SOUTHWEST MISSISSIPPI JUNIOR COLLEGE. No charge.

Detailed specifications may be obtained from the CDPA office. The CDPA reserves the right to reject any and all bids and proposals and to waive informalities.

Patsy Stanley @ (601) 359-3504

BUY - SELL - LEASE

IBM
4381

ASK FOR MIKE DEIKLER

New York Systems Exchange
Melville, New York

CDLA Area Code: 516
673-3830

IBM 3090 - 150E

Available June 1988

For Sale or Lease

Private Company

IBM Maintained

Interested Parties

Reply to CW-B5048
Computerworld
Box 9171
Framingham, MA 01701-9171

IBM PC's

CDB

Now from One Source!

digital IBM

BUY, SELL, LEASE, TRADE

Systems, Disk Drives, CPU's, Memory, Printers, Modules, Controllers, Tape Drives, Spares, Communications, Terminals

All equipment eligible for DEC or IBM maintenance.

CSI Comparex Systems, Inc.

Toll Free 1-800-[illegible]
In Mass. 617-344-8800
FAX 617-344-4199

MARKETPLACE Is Here!

Reach Over 612,000 Computer Professionals!
Call for all the details

(201) 967-1358 (617) 879-0700 ext. 758, 759, 784

Rental & Leasing

NEED MORE MIPS?
Call 800-243-5307

APRIL 1988 Copyright 1988 Randolph Computer Corporation

IBM

SYSTEMS	MIPS (Millions of Instructions Processed Per Second)	MEGABYTES
9373-20	0.3	4 to 16
9375-40	0.3	8 to 16
4331-2	0.50	1 to 4
S/38-300	0.58	8 to 8
S/38-400	0.75	8 to 8
9375-60	0.76	8 to 16
4341-1	0.88	2 to 4
S/38-600	0.98	8 to 16
S/38-700	1.1	16 to 32
4361-11	1.4	4 to 16
4361-5	1.45	2 to 12
4341-2	1.5	2 to 16
9377-80	1.8	8 to 16
4341-12	1.88	2 to 16
†4381-21	2.1	8 to 16
4381-1	2.1	4 to 16
4381-2	2.7	4 to 32
4381-12	2.7	8 to 32
†4381-22	3.1	16 to 32
4381-13	3.6	8 to 32
3083EX	4.4	8 to 32
4381-3	4.5	8 to 32
†4381-23	4.7	16 to 32

SYSTEMS	MIPS (Millions of Instructions Processed Per Second)	MEGABYTES
*4381-91E	4.7	16 to 64
3033UP	5.0	4 to 24
4381-14	5.0	16 to 32
3083BX	5.5	8 to 32
9370-120E	5.5	32 to 64
†4381-24	7.0	16 to 64
*4381-92E	7.3	16 to 64
3083JX	6.1	8 to 32
3090-150	16.2	16 to 64
3081K	13.5	16 to 32
3090-150E	16.2	32 to 64
3081D	11.0	16 to 64
3090-180	15.4	32 to 64
3083JX	9.5	16 to 64
3090-180E	17.3	32 to 64
3090-200	17.3	64 to 128
3084QX	26.7	32 to 128
3090-200E	31.0	64 to 128
3084QX	31.0	64 to 128
3090-300E	44.6	64 to 128
3090-400	50.0	128 to 256
3090-400E	58.0	128 to 256
3090-500E	67.0	128 to 256
3090-600E	75.0	128 to 256

*1st Installation 11/88 ●1st Installation 2Q/88
●1st Installation 3Q/88 †1st Installation 1Q/89

SYSTEMS	MEGABYTES
5840	16 to 128
5850	16 to 128
5860	16 to 128
5867	24 to 128
5868	32 to 256
5870	32 to 128
5880	32 to 256
5890-190E	64 to 256
5890-200E	64 to 256
5890-300E	64 to 256
5890-400E	128 to 512
5890-600E	128 to 512

NATIONAL ADVANCED SYSTEMS

SYSTEMS	MIPS	MEGABYTES
AS/VL-50	7.5	32 to 128
AS/VL-60	16.0	32 to 128
AS9000	11.0	16 to 64
ASXL-50	15.0	32 to 64
AS9070	16.6	16 to 64
AS/VL-80	17.1	32 to 256
AS9060	20.0	16 to 64
ASXL-60	28.0	64 to 256
ASXL-80	50.0	64 to 256
ASXL-90	67.0	128 to 512
ASXL-100	80.0	128 to 512

The above information is intended as a guideline for computer users on relative computer systems instruction cycle times. All data have been derived from published documentation and represent reasonable estimates of average MIPS ratings. However Randolph is not responsible for the accuracy of the MIPS data. Cycle times will vary based on hardware/software configurations and system manufacturers continually modify computer models as design improvements in hardware and software arise.

TALK TO RANDOLPH NOW. Whatever your computer system needs, Randolph can deliver the hardware when you need it . . . and ease the pressure on your DP budget with low lease rates. Call 800-243-5307, in CT (203) 661-4200.

Randolph

Randolph Computer Corporation
Subsidiary of Bank of Boston • 537 Steamboat Road, Greenwich, CT 06830

FOR RENT
IBM & COMPAQ
PC ● XT ● AT
Deskpro/Portable
1 Month - 3 Years
THE COMPUTER TRADERS
404-980-9233
FAX 404-951-2573

612,000 MIS/DP Professionals
see the ***MARKETPLACE***
each week
Call for advertising information:
(201) 967-1358
(617) 879-0700

TANDEM EQUIPMENT
For Lease or Sale
T16/1422's and T16/2422's and various peripherals available for sale or lease
We also have
IBM 3380
Disk Storage Devices and IBM 3665 Modems
We provide leasing on all types of equipment
Call
SmithWilson
312-641-2600
FAX 312-641-4844

Call to place your ad today
(800) 343-6474
(617) 879-0700

BUY SELL LEASE
DEC/VAX
CALL
COMPUTER PROVISIONS
Lou Vascek
Kelly Kagels
(216) 248-7878
or
(800) 832-4664

Peripheral Equipment

AIR ROVER
PORTABLE SPOT COOLING SYSTEM
REFRIGERATED AIR
AVAILABLE SIZES
1-5 TONS
• AIR COOLED (no water necessary)
• 1 TON PLUGS INTO 110 VOLT OUTLET
• THERMOSTATIC CONTROL
• HOT GAS BYPASS (11,000 - 60,000 BTU's)
• PORTABLE - ROLLS THROUGH STANDARD DOOR OPENINGS
IDEAL FOR
• COMPUTER ROOMS • PBX and ELECTRONIC EQUIPMENT ROOMS
• OFFICES • FACTORIES and
• REMOTE LOCATIONS
GREAT FOR
AFTER HOUR, WEEKEND, SUPPLEMENTARY and EMERGENCY COOLING
AIR ROVER
1 (214) 877-3430
or FAX 1 (214) 877-2783

Hardware

BURROUGHS UNISYS
B20 - B7000
A Series - V Series
All Peripherals
Low Lease Rates
Depot Maintenance
COMPUTER PROVISIONS CORPORATION
800-832-4664

Software

Looking for Software Tools Distributorship in Germany

We are one of the largest European facilities management companies based in Germany with 10 other offices in the major European cities. We already have 400 MVS/XA IBM users and employ more than 100 people. To improve our service activities we are looking for the following software tools to be distributed in Germany.

Operation/Automation
Performance Management
MIS
Optimizer

Reply to CW-88046
Computerworld
Box 9171
Framingham, MA 01701-9171

You Have 10 Ways To Advertise Your Products In The *MARKETPLACE*

Featuring:

- ☐ Used Equipment
- ☐ Hardware
- ☐ Software
- ☐ Communications Equipment
- ☐ Rental & Leasing
- ☐ Time & Services
- ☐ Supplies
- ☐ Bids & Proposals
- ☐ Training
- ☐ Financial Business Services

Reach over 612,000 information systems professionals by placing your company's message in Marketplace.

Name:_____
Title:_____
Company:_____
Address:_____
City:_____
State:_____ Zip:_____
☐ I am enclosing ad material with this form
Ad size:
_____ columns wide x _____ inches deep.

Return this form and advertising material to:

Computerworld
Marketplace
375 Cochituate Road, Box 9171
Framingham, MA 01701-9171

or call a representative today for the details:

Midwest: (617) 620-7758
Northeast: (617) 620-7784
West: (617) 620-7759
East: (201) 967-1358

Time & Services

Operations Consulting

- Data Center Relocation
- Disaster Recovery
- Capacity Planning
- Teleprocessing
- Systems Programming

TRECOM
Business Systems Inc.

45 Broadway, New York, NY 10006
(212) 809-6600
Contact: John Harvey

Our time is your time. Anytime.

Let us SOLV your data processing problems. Take advantage of our:

- IBM 3081 and 3090 CPUs.
- MVS/XA environment.
- Full CICS, IMS, DB2 Services.
- Service Level Guarantees.
- Extensive Network Capabilities.

Get the facts—Free!
1-800-366-7737

SOLV-9000 FOR REMOTE COMPUTING SERVICES

From Security Pacific Information Services Corporation.

- IBM/3090 Environment MVS/XA
- IBM/4381 Environment VM/CMS
- TSO, CICS, VM, CMS, PROFS
- Compilers and Packages
- No Charge Connect or Memory
- PAYROLL, and HOGAN Banking
- Fixed Rates Available
- Facilities Management

for online information call

(300-2400 baud 8 bit, no parity 1 stop bit) and enter the access code FIN-TECH1 when prompted.

Financial Technologies
14300 Sullyfield Circle
Chantilly, VA 22021
(703) 631-4300

DEC SPECIALISTS
VAX 8600 & PDP-11

TIME SHARING

NO CPU CHARGES
$7/$10
RSTS/E VMS
PER HOUR CONNECT TIME

BUDGET BYTES® 212-944-9238

- ☐ TIMESHARING
- ☐ GENERAL CONSULTING
- ☐ SOFTWARE DEVELOPMENT
- ☐ FACILITIES MANAGEMENT
- ☐ COMPUTER EQUIPMENT & SUPPLIES
- ☐ HARDWARE MAINTENANCE (NY METRO AREA)
- ☐ MEDIA CONVERSION
- ☐ EXECUTIVE SEARCH
- ☐ COMPUTER ASSOCIATES ACCOUNTING SOFTWARE FOR VAX/VMS

Omnicomputer, Inc.®
1440 Broadway, New York, N.Y. 10018

COMPUTER SERVICES
IBM 3084

● Batch Processing ● Public Network Access
● Timesharing ● Laser Printing

Route 202, Raritan, N.J. 08869
201-685-3400
Contact: Joyce Segsenke

SHOP in...
Computerworld's MARKETPLACE
Call for details!
(617) 620-7704 (617) 620-7700
(617) 620-7700 (201) 967-1358

How to increase your power without paying the price.

Turn to Manufacturers Hanover Data Services Corporation for low-cost, state-of-the-art timesharing and information Center services

- Secure environment
- Software includes MVS/SP, VM/SP, VM/XA, TSO, GDDM, CMS, and Presentation Graphics Equipment
- Processing done on IBM 3084 MX3 and IBM 4381 systems
- Accessible via many telecommunications methods
- Volume discounts

For more information write:

Jeff Daum
Manufacturers Hanover Data Services Corporation
P.O. Box 26
Carlstadt, New Jersey 07072

Or call (201) 896-2030

IBM is a trademark of International Business Machines Corporation.
© 1987 Manufacturers Hanover Trust

COMPUTING SERVICES

MVS/XA VM/370 DOS/VSE
CICS TSO CMS
DB2 IMS/DBDC 4GL SAS

MULTIPLE CPUs - 50+ MIPS

TELENET, TYMNET
IBM INFORMATION NETWORK

DEDICATED SYSTEMS AVAILABLE

GIS
INFORMATION SYSTEMS, INC.
515 COMMERCE DRIVE
OAK BROOK, IL 60521
312-574-3636

Full-Service Remote Computing With a Difference

Let us be your data center. And get high-quality computing service that can make a big difference in your bottom line. All from MichCon Computer Services.

Full IBM compatability:

MVS/XA JES2	IMS/DC
VM/XA	IDMS/R
CICS/VS	DB2
ROSCOE	QMF
TSO/E	PROFS

We also have the latest programmer productivity aids: FILE-AID, DBUG-AID, CICS PLAYBACK and CICS ABEND-AID to name a few.

We provide state-of-the-art systems, software and security for major clients across the country. And we deliver high-quality, cost-effective services that include:

- Laser and high-speed custom (advanced function) printing
- Mail insertion

For more information, call
1-800-521-0444

MichCon Computer Services
2225 Auto Club Drive
Dearborn, MI 48126

TIMESHARE
MVS - VM - DOS

- Save 25% on current charges
- Full Service - 24 Hours
- Laser Printing
- Data Entry
- All Communications
- Tymnet - XCOM 6.2

Call: Ted Moulder
1-800-422-3220

STAFTAB Established 1936

COMMERCIAL DATA PROCESSING
 # - 1

MVS/SP JES 2
TSO/ISPF CICS

Programming and Data Entry. Customer area and Support. Batch and Remote Processing. Diskette/Tape Conversions.

Contact:
Greg Gorab
(201) 882-1660

● Epoxy Rd., Parsippany, NJ

Supplies

MVS

PERFORMANCE ENGINEERING

- We Guarantee performance improvements!
- If our engineers cannot improve your systems performance according to *exact written* objectives - you pay nothing!
- Done without any additional hardware or software.
- Improve response times, maximize batch throughput, and defer hardware purchases.
- Save potentially millions on this years budget.
- Initial system analysis is absolutely free of charge or obligation.

IF WE DON'T SAVE YOU MONEY WE CHARGE NOTHING!

Phone: 1-800-562-8722
(In Texas, (713) 451-0191)
Bennett Software Inc
Engineering Services
POB 96694, Houston, TX 77213-6694

***MARKETPLACE* Is Here!**

Reach Over 612,000 Computer Professionals!
Call for all the details

(201) 967-1358 (617) 879-0700 ext. 758, 759, 784

Training

You Have 10 Ways To Advertise Your Products In The MARKETPLACE

Featuring:

☐ Used Equipment ☐ Hardware
☐ Software ☐ Communications Equipment
☐ Rental & Leasing ☐ Time & Services
☐ Supplies ☐ Bids & Proposals
☐ Training ☐ Financial Business Services

Reach over 612,000
Information Systems Professionals each week

Name:_____

Title:_____

Company:_____

Address:_____

City:_____

State:_____ Zip:_____

☐ I am enclosing ad material with this form

Ad size:

_____ columns wide x _____ inches deep.

Return this form and advertising material to:
Computerworld Product Classified
Marketplace
375 Cochituate Road, Box 9171
Framingham, MA 01701-9171

or call a representative today for all the details:

East (201) 967-1358 Midwest (617) 620-7758
Northeast (617) 620-7784 West (617) 620-7759

Effectively marketing advanced user training

BY NAOMI KARTEN
SPECIAL TO CW

Advanced training can be a more complex undertaking than introductory training. Trainers can focus more on content and less on relieving anxiety. Course material is more sophisticated, and students are at a level at which they ask tougher questions. To market advanced training effectively, it is important to take these distinctions into account.

Promotion is important for all levels of training, but it is only one component of a marketing effort. Marketing includes three other broad groups of activities: identifying customer needs, formulating products to meet the needs and evaluating the products' success.

With introductory training, marketing that focuses strictly on getting the word out may be adequate. But people who have attended introductory classes often do not perceive the need for more advanced training. Therefore, it is important to identify users' specific needs.

The key is to work both with and through user management. This approach ensures that training meets real business needs, rather than assumed needs, and increases user management's commitment to training.

It may also provide some insight into ways in which introductory training can be improved or targeted more precisely to business needs. Identifying user needs should be an ongoing activity.

An important aspect of formulating courses and training material is assessing the "look and feel" of training that will work best with advanced users. The pacing of classes should allow students to move along at a comfortable speed. Advanced students are usually eager to "give it a try" and course material should give them ample opportunity to do so. Trainers should consider the feasibility of training in which students work at their own pace, seeking help from trainers when needed.

By the time students are ready for advanced training, they do not need help in learning so much as they need management-sanctioned time to learn. Therefore, their training may be more loosely structured and more student-driven than novice training.

Measuring the success of advanced training is as important as measuring the success of introductory training — and it is as rarely done. Evaluation forms may adequately describe students' level of satisfaction with a course, but the evaluations are not a measure of whether the material will be retained and, more importantly, used.

Following up with students 30 to 60 days after a class almost always yields useful information. It may be that students are applying the material in unforeseen ways; knowing this fact can help trainers sell their successes to management. It may be that students are faltering in applying the material and that adjustments need to be made in course content or delivery. It may be that students have not been given time to use what they have learned, suggesting a failure to sell the value of the class to user management. Or it may be that the class was not presented well.

Since word of mouth is the most effective marketing technique, news of a poorly delivered class will spread quickly. And the most well-designed class will be of little value if no one shows up.

Karten is president of Karten Associates in Randolph, Mass.

C LANGUAGE TRAINING

* Introduction to C (3 days) @ $4500/class
* Techniques of C (2 days) @ $3000/class
* Developing Applications in C (2 days) @ $3000/class

Training on your site + expenses.
Public classes also available. 5 days @ $995/student.
Class dates: 6/6 - 6/10, 7/11 - 7/15, 8/15 - 8/19, 9/26 - 9/30, 10/17 - 10/21
Handouts, Code Examples & Textbook included.
COMPUTER LANGUAGE ARTS, INC.
1008 Swallow Drive
Cherry Hill, New Jersey 08003
(609) 429-3780

PC to Mainframe Hardware & Software

CXI, MOM, DCA, Avatar, AST Research, Quadram & other brands of emulation boards & software.
All items are now Below Wholesale
Special Price for entire lot.
Call: (603) 762-7751
Ask for: Patrick Henry

COMPUTERWORLD

SALES OFFICES

Publisher/Fritz Landmann

Vice President/Associate Publisher/Val Landi, COMPUTERWORLD, 375 Cochituate Road, Box 9171, Framingham, MA 01701-9171, (617) 879-0700

BOSTON: Northern Regional Manager/David Peterson, District Managers/Bill Cadigan, Sherry Driscoll, Account Manager/John Watts, Sales Assistant/Alice Longley, COMPUTERWORLD, 375 Cochituate Road, Box 9171, Framingham, MA 01701-9171 (617) 879-0700

CHICAGO: Eastern Regional Director/Bernie Hockswender, Midwest Regional Manager/Kevin McPherson, District Manager/Larry Craven, Sales Assistants/Kathy Sullivan, Karol Lange, COMPUTERWORLD, 10400 West Higgins Road, Suite 300, Rosemont, IL 60018, (312) 827-4433

NEW YORK: Eastern Regional Director/Bernie Hockswender, District Managers/Fred Lo Sapio, Frank Genovese, Sales Assistants/Mary Tagliaferri, Sue Larson, COMPUTERWORLD, Paramus Plaza I, 140 Route 17 North, Paramus, NJ 07652 (201) 967-1350

LOS ANGELES: Western Regional Director/Mark V. Glasner, District Managers/Carolyn Knox, Gary Hooks, Sales Assistant/Bev Rose, COMPUTERWORLD, 18004 Sky Park Circle, Suite 255, Irvine, CA 92714 (714) 261-1230

SAN FRANCISCO: Western Regional Director/Mark V. Glasner, Senior District Manager/Ernie Chamberlain, District Managers/Jan Harper, Michele O'Conner, Account Manager/Alicia Santiello, Sales Assistants/Christina Warhurst, Robert Condevaux, COMPUTERWORLD, 500 Airport Boulevard, Suite 400, Burlingame, CA 94010 (415) 347-0555

ATLANTA: Eastern Regional Director/Bernie Hockswender, Southeastern Regional Manager/Kevin C. Harold, Sales Assistant/Melissa Christie, COMPUTERWORLD, 1400 Lake Hearn Drive, Suite 330, Atlanta, GA 30319 (404) 394-0758

DALLAS: Eastern Regional Director/Bernie Hockswender, Southeastern Regional Manager/Kevin C. Harold, COMPUTERWORLD, 14651 Dallas Parkway, Suite 304, Dallas, TX 75240 (214) 233-0882

WASHINGTON, D.C.: Eastern Regional Director/Bernie Hockswender, District Manager/Paula Smith, COMPUTERWORLD, Paramus Plaza I, 140 Route 17 North, Paramus, NJ 07652 (201) 967-1350

PRODUCT CLASSIFIED ADVERTISING: Product Classified Advertising Director/Eastern Account Manager/Debbie Eisenberg, Paramus Plaza I, 140 Route 17 North, Paramus, NJ 07652 (201) 967-1350

New England Account Manager/Paul Bonarrigo, 375 Cochituate Road, Box 9171, Framingham, MA 01701-9171 (617) 879-0700

Midwest Account Manager/Mary Campo, 375 Cochituate Road, Box 9171, Framingham, MA 01701-9171 (617) 879-0700

Western Account Manager/Karen Massimino, 375 Cochituate Road, Box 9171, Framingham, MA 01701-9171 (617) 879-0700

RECRUITMENT ADVERTISING: National Recruitment Sales Director/John Corrigan, 375 Cochituate Road, Box 9171, Framingham, MA 01701-9171 (617) 879-0700

RECRUITMENT ADVERTISING SALES OFFICES:
New England Recruitment Manager/Al DeMille, 375 Cochituate Road, Box 9171, Framingham, MA 01701-9171 (617) 879-0700

Mid-Atlantic Recruitment Manager/Warren Kolber, Paramus Plaza I, 140 Route 17 North, Paramus, NJ 07652 (201) 967-1350

Midwest Recruitment Manager/Patricia Powers, O'Hare Corporate Tower One, 10400 West Higgins Road, Suite 300, Rosemont, IL 60018 (312) 827-4433

Western Recruitment Manager/Barbara Murphy, 18004 Skypark Circle, Suite 100, Irvine, CA 92714 (714) 250-0164

South-Atlantic Recruitment Manager/Kathryn Kress, 3022 Javier Road, Suite 210, Fairfax, VA 22031 (703) 573-4115

Recruitment Telemarketing Account Executives: New England/Nancy Percival, New York/Jay Novack, Mid-Atlantic/Pauline Smith, Midwest/Ellen Casey, Western/Chris Glenn, 1-800-343-6474 or (617) 879-0700

IDG INTERNATIONAL MARKETING SERVICES:
Managing Director/Frank Cutitta, COMPUTERWORLD, 375 Cochituate Road, Box 9171, Framingham, MA 01701-9171 (617) 879-0700

West Coast Marketing Manager/Leslie Barner, 3350 West Bayshore Road, Suite 201, Palo Alto, CA 94303 (415) 424-1001

CW PUBLISHING/INC.

An IDG Communications Company

Fritz Landmann/President

Computerworld Headquarters: 375 Cochituate Road, P.O. Box 9171, Framingham, MA 01701-9171
Phone: 617-879-0700, Telex: 95-1153, FAX: 617-875-8931

Vice President/Associate Publisher, Val Landi

OPERATIONS: Vice President/Operations, Matthew Smith. Business Manager, Mark Sullivan.
SALES: Advertising Director, Carolyn Novack. National Recruitment Sales Director, John Corrigan.
Display Advertising Production Manager, Maureen Carter. Product Classified Operations Director, Anne E. Hadley.
Classified Operations Manager, Cynthia Delany.

MARKETING: Vice President Marketing & Circulation, Jack Edmonston. Marketing Communications Director, Jan Bell.
Marketing Services Director, Audrey Shohan. Manager/Marketing Communications, Mary Doyle.

CIRCULATION: Vice President Marketing & Circulation, Jack Edmonston.
Director of Circulation Management, Maureen Burke. Director of Circulation Promotion, Jane Eyler.

PRODUCTION: Production Director, Leigh Hometh. Assistant Production Director, Carol Polack.
Production Manager, Beverly Wolff. Art Director, Tom Monahan.

FOREIGN EDITORIAL/SALES OFFICES

Argentina: Ruben Argento, CW Communicaciones S/A, Av. Belgrano 406-Piso 9, CP 1092 Buenos Aires. Phone: (011) 54 134-5583. Telex: (390) 22644 (BAZAN AR).

Asia: S.W. Chan, Asia Computerworld Communications Ltd., 701-4 Kam Chung Bldg., 54 Jaffe Road, Wanchai, Hong Kong. Phone: (011) 852 5 861 3238. Telex: (780) 72827 (COMWOR HX).

Australia: Alan Power, IDG Communications Pty. Ltd., 37-43 Alexander Street, Crows Nest, NSW 2065. Phone: (011) 61 2 4395133. Telex: (790) AA74752 (COMWOR).

Austria: Manfred Weiss, CW Publikationen Verlagsgesellschaft m.b.H., Ziegelgasse 8, A-1070 Wien, Austria. Phone: (011) 43-222-930600. Telex: (847) 115 542 (SCH/A).

Brazil: Ney Kruel, Computerworld do Brasil, Rua Alcindo Guanabara, 25-11 andar, 20.031 Rio de Janeiro, RJ Brazil. Phone: (011) 55 21 240 8225. Telex: (391) 21 30838.

Denmark: Preben Engell, Computerworld Danmark A/S, Tarvegade 52, 1400 Copenhagen K, Denmark. Phone: (011) 45 1955 695. Telex: (855) 31566.

France: Francois Chaussonniere, Computerworld Communications S.A., 185 Avenue Charles De Gaulle, 92200 Neuilly Sur Seine, France. Phone: (011) 33 14 747 1272. Telex: (842) 613234 F.

Hungary: Dezso Futasz, Computerworld Informatika Co. Ltd. H-1536 Budapest, Pf. 386, Hungary. Phone: (011) 36 1 226 459. Telex: (861) 22 6307 (CWI H).

Italy: Jean-Louis Redon, Computer Publishing Group S.R.L., Via Vida 7, 20127 Milano, Italy. Phone: (011) 39-2-2613432. Telex: (843) 335318.

Japan: Dick Yamashita, Computerworld Japan, Akasaka Onsenmachi Bldg., Minato-ku, Tokyo 107. Phone: (011) 81 3 561 3882. Telex: (781) 252-4217 (Computerworld Japan only).

M. Nakamura, IDG Communications, Japan, c/o Marcom International, Inc., Akasaka Center Building, 1-3-12 Motoakasaka, Minato-ku, Tokyo 107, Japan. Phone: (011) 81 3 403-8515. Telex: (781) J27941 (reps for all CW Publishing publications except Computerworld Japan).

Mexico: Henry Morales, Computerworld/Mexico S.A. de C.V., Oaxaca 21-2, Mexico City 7 D.F. Colonia Roma, 06700 Mexico. Phone: (905) 514-4218 or 6309. Telex: (383) 177 1300 (ACHAME).

The Netherlands: Wout Berends, CW Communications B.V., van Engelenstraat 84, 1071 GK Amsterdam, The Netherlands. Phone: (011) 31 20 646426. Telex: (844) 18242 (CWCOM NL).

New Zealand: Martin Taylor, Computerworld Communications Ltd., 2nd Floor, 15 Augustus Terrace, Parnell, Auckland, New Zealand. Phone: (011) 64-9-779-902. Fax: (011) 64 9 780 244

Norway: Morten Hansen, CW Norge A/S, Hovmeien 43, 0578 Oslo 5, Norway. Phone: (011) 472 547725. Telex: (856) 76476 (CW NOR N).

People's Republic of China: Chen Minghun, China Computerworld, 74 Lu Gu Road, Box 750, Beijing 100039, People's Republic of China. Phone: (011) 47 914 8174. Telex: (716) 222214 (CCW CN).

Spain: Francisco Zabala, CW Communications, S.A., Rafael Calvo 18, 4B, 28010 Madrid, Spain. Phone: (011) 34 1 419 4014. Telex: (831) 45522 (CW E).

Sweden: Bengt Marmfeldt, CW Communications AB, Sodra Hamnvagen 22, S-115 41 Stockholm, Sweden. Phone: (011) 46 8 67 91 80. Telex: (854) 14904 S (NOVACW).

Switzerland: Gebhard Osterwalder, CW Publikationen AG, Witikonerstrasse no. 15, Postfach 253, CH - 8030 Zurich, Switzerland. Phone: (011) 41 1 55 10 77. Telex: (845) 816 710 (CWCI CH).

Taiwan: Leong Wang, ACE Media Agency Co. Ltd., P.O. Box 26-578 Taipei, Taiwan, R.O.C. Phone: (011) 02 751 3636. Telex: (785) 14142 (ACE GROUP). (Representative for all CWCI publications).

London: Martin Durham, CW Communications Ltd., 99 Grays Inn Rd., London, WC1 8UT, United Kingdom. Phone: (011) 44 1 831 9252. Telex: (851) 262346 (THEPUB G)

United Kingdom: Euan Ross, Sedra Hobson & Associates, 34 Warwick Road, Kenilworth, Warwickshire, CV8 1HE, United Kingdom. Phone: (011) 09 26 512424. Telex: (851) 311951 (SEEHOB). (Representative for all CWCI publications).

Venezuela: Kalman von Vajna Nagy, CW Comunicaciones, C.R.L. Torre Maracaibo, Piso 13, Oficina H, Av. Libertador, Caracas, Venezuela. Phone: (011) 58 2 72 76 30

West Germany: Eckhard Utpadel, CW Publikationen Verlagsgesellschaft mbH, Rheinstrasse 26/28, Postfach 40 0429, 8000 Munchen 40, West Germany. Phone: (011) 49 89 360860. Telex: (841) 5215350. (COMW D).

IDG COMMUNICATIONS/INC.

Patrick J. McGovern, Board Chairman — Axel Leblois, Chief Executive Officer — William P. Murphy, Vice President/Finance

Computerworld is a publication of IDG Communications, the world's largest publisher of computer-related information. IDG Communications publishes over 90 computer publications in 33 countries. Fourteen million people read one or more IDG Communications publications each month. IDG Communications publications contribute to the IDG News Service offering the latest on domestic and international computer news. IDG Communications publications include: ARGENTINA'S Computerworld Argentina; ASIA'S Communications World, Computerworld Hong Kong, Computerworld Southeast Asia, PC Review; AUSTRALIA'S Computerworld Australia, Communications World, Australian PC World, Australian Macworld; AUSTRIA'S Computerwelt Oesterreich; BRAZIL'S DataNews, PC Mundo, Micro Mundo; CANADA'S Computer Data; CHILE'S Informatica, Computacion Personal; DENMARK'S Computerworld Danmark, PC World Danmark, CAD/CAM World; FINLAND'S Mikro, Tietoviikko; FRANCE'S Le Monde Informatique, Distributique, InfoPC, Telecoms International; GREECE'S Computer Age; HUNGARY'S Computerworld SZT, PC Mikrovilag; INDIA'S Dataquest, PC World India; ISRAEL'S People & Computers Monthly, People & Computers Weekly, 3DM Monthly; ITALY'S Computerworld Italia; JAPAN'S Computerworld Japan, [illegible]; MEXICO'S Computerworld Mexico, PC Journal; THE NETHERLANDS' Computerworld Netherlands, PC World Benelux; NEW ZEALAND'S Computerworld New Zealand, Computerworld Norge, PC World Norge; PEOPLE'S REPUBLIC OF CHINA'S China Computerworld, China Computerworld Monthly; SAUDI ARABIA'S Arabian Computer News; SOUTH KOREA'S Computerworld Korea, PC World Korea; SPAIN'S CIMWorld, Computerworld Espana, Commodore World, PC World Espana, Comunicaciones World; SWEDEN'S Computer Sweden, MikroDatorn, Svenska PC World; SWITZERLAND'S Computerworld Schweiz; UNITED KINGDOM'S Computer News, ICL Today, Lotus, PC Business World; UNITED STATES' Amiga World, CD-ROM Review, CIO, Computer Currents, Computerworld, Digital News, Federal Computer Week, 80 Micro, FOCUS Publications, InCider, InfoWorld, Macintosh Today, Macworld, Computer + Software News (Micro Marketworld/Lebhar-Friedman), Network World, PC Letter, PC World, Portable Computer Review, Publish!, PC Resource, Run; VENEZUELA'S Computerworld Venezuela; WEST GERMANY'S Computerwoche, Information Management, PC Welt, PCWelt, Run/Run Specials.

ADVERTISERS INDEX

ADR 3,69
AI Corp. 22
Alcatel Business Systems.... 20-21
Aluminum Case....................82
Amdahl EPS....................72
Apollo Computer 37-39
Arthur Andersen.................. 16-17
Ashton Tate....................86
AST Research.................. 52-53

B.I. Moyle & Associates....................26
BMC Software....................40,48
Businessland....................36

Chicago Soft....................43
Cincom Systems....................64
Command Technology Corp...S4,S8
Compugraphic....................SC4
Computer Corp. of America.. 70-71
CW Button....................65
CW Circulation....................SC3
CW Focus....................81
CW Marketplace...............S4,48,82
CW Promotion.................. 49-51
CW Spotlight....................106

Data Design Associates....................41
Data General....................47
Digital Equipment Corp. 44-45

Execucom....................S6
Expoconsul International 83

Forest Computer 55

Goal Systems 68

Hewlett Packard..............59,61,63

IBM S6-S7
IDC Financial Services 80
Innovation Data Processing..........7
Integral Systems....................10

Interface Systems....................67

Landmark Systems 54,78
Leasametric....................66
Lotus Development Corp. 26

McCormack & Dodge 112
Micro Focus 31

NCR 56-57
NEC....................32
Network Equipment Corp. 84-85

On-Line Software 27,29
Oracle 9

PC Expo.................... 88-89
Platinum Technology....................25
Princeton Graphics 74

Quality Micro Systems S12

Realia....................30
Relational Technology Inc...........24

SAS Institute.................. 12-13,23
Softsphere Inc. 48
Software AG.................... 14-15
Software Engineering of America 11
Sorbus....................111
Syncsort....................5

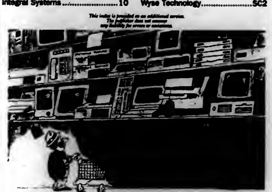
Tandem Computer.............. 42-43
Televideo....................64/65
Telex Computer.................. 34-35
3 Com Corp. 75

Unisys 76-77

Venturcom 79

Wyse Technology....................SC2

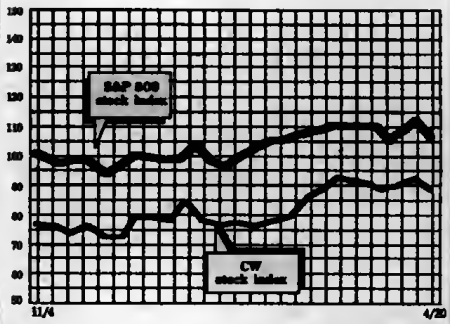
This index is provided as an additional service. The publisher does not assume any liability for errors or omissions.



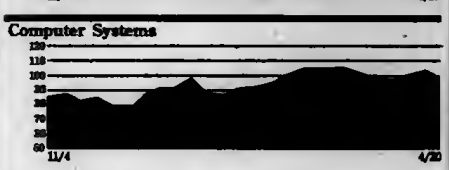
Upcoming Computerworld Spotlight Sections

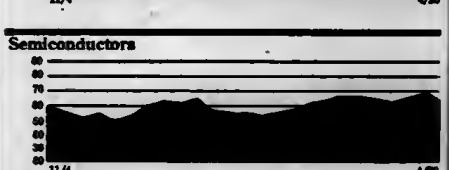
Issue Date	Topic	Ad Closing Date
May 23	Data Communications	May 6
June 6	CASE	May 20
June 20	The SNA Market	June 3
July 11	Disaster Prevention & Recovery Products & Services	June 24
July 25	Productivity Software	July 8
Aug. 8	TBA	July 22
Aug. 29	DB2 Market	Aug. 12
Sept. 19	Hardware Roundup: Large, Medium Scale and Special Purpose Systems	Sept. 2
Sept. 26	Hardware Roundup: Small Scale Systems	Sept. 9
Oct. 3	Hardware Roundup: Personal Computers and Workstations	Sept. 16
Oct. 17	AI/Expert Systems	Sept. 30
Oct. 31	Unix	Oct. 14

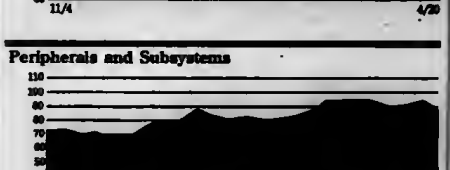
STOCK TRADING INDEX



Indexes	Last Week	This Week
Communications	96.6	92.7
Computer Systems	104.5	99.3
Software & DP Services	103.0	98.3
Semiconductors	69.5	65.7
Peripherals & Subsystems	93.8	89.7
Leasing Companies	122.2	116.9
Composite Index	93.5	89.2
S&P 500 Index	113.0	107.0







Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, APRIL 20, 1988

E = EXCH; 3 = 52-WEEK RANGE (1); C = PRICE CLOSE APRIL 20 1988; N = WEEK NET CHANGE; WEEK PCT CHANGE

Communications and Network Services

E		52-WEEK RANGE (1)		CLOSE APRIL 20 1988	WEEK NET CHANGE	WEEK PCT CHANGE
N	AMERICAN INFO TECH IS CORP	100	74	88.13	-8.5	-8.5
Q	ANDREW CORP	18	11	12.25	-0.5	-2.8
Q	ARTEL COMM CORP	3	2	2.13	0.1	5.3
N	AT&T	38	20	36.50	-1.5	-9.4
Q	AVANT GARDE COMP INC	5	3	1.50	-0.1	-7.7
A	AVANTEK INC	17	6	8.63	-0.5	-10.2
N	AYDIN CORP	36	16	22.38	-1.9	-7.7
N	BELL ATLANTIC CORP	60	51	54.63	-4.4	-8.5
N	BELLSOUTH CORP	44	35	37.88	-1.8	-4.7
Q	COMPRESSION LABS INC	7	3	3.12	-0.5	-7.4
Q	COMPUTER NETWORK TECH	9	1	1.38	-0.1	-4.6
Q	CONTEL CORP	40	35	33.50	-1.6	-4.6
Q	DATA SWITCH CORP	10	4	7.88	-0.9	-10.0
Q	DIGITAL COMM ASSOC	29	20	20.88	-1.8	-8.0
Q	DYNATECH CORP	33	14	23.00	0.5	2.2
Q	FIBRONICS INTERNATIONAL INC	9	3	3.88	-0.2	-5.1
Q	GANDALF TECHNOLOGIES	10	9	7.38	0.0	0.0
Q	GENERAL DATACOMM INDS	14	3	3.63	0.1	3.6
N	GTE CORP	45	26	34.88	-1.8	-5.1
Q	INFOTRON SYS CORP	12	9	9.50	-0.5	-7.3
N	ITT CORP	68	42	46.38	-2.4	-5.0
N	M A COM INC	18	7	8.76	-0.4	-4.9
Q	MCI COMMUNICATIONS CORP	13	5	13.00	0.1	1.0
Q	MICOM SYS INC	17	7	13.50	0.4	2.9
Q	NETWORK SYS CORP	14	7	3.88	-1.1	-11.3
N	NORTHERN TELECOM LTD	24	14	18.00	-0.3	-1.6
Q	NOVELL INC	30	13	16.75	-1.3	-7.1
N	NYNEX CORP	78	66	62.38	-2.8	-0.3
N	PACIFIC TELESIS GROUP	34	23	27.38	-1.8	-6.0
N	PARADYNE CORP	9	4	4.63	-0.1	-2.6
A	PEARL CORP	9	1	4.13	0.0	0.0
N	PLESSEY PLC	40	23	30.00	1.3	5.3
Q	SCIENTIFIC ATLANTA INC	23	9	15.00	-0.5	-1.8
N	SOUTHWESTERN BELL CORP	48	32	34.88	-1.8	-4.8
Q	3 COM CORP	26	13	18.63	-0.9	-4.5
N	TIMEPLEX INC	40	17	32.30	0.0	0.0
N	UNGERMANN BASS INC	16	8	12.00	-0.1	-1.0
N	U S WEST INC	60	43	51.00	-3.1	-5.8

Computer Systems

Q	ALLIANT COMPUTER SYS	36	9	7.88	-0.2	-3.2
Q	ALPHA MICROSYSTEMS	6	3	5.25	-0.1	-2.3
Q	ALTOS COMPUTER SYS	19	6	6.38	-0.9	-8.8
A	AMDAHL CORP	30	15	26.38	-0.5	-1.4
Q	APOLLO COMPUTER INC	25	9	14.38	-1.4	-8.7
Q	APPLE COMPUTER INC	50	26	30.75	-1.2	-2.8
N	BOLT BERANEK & NEWMAN	25	12	18.63	0.5	0.0
Q	BRITTON LEE INC	3	1	1.38	-0.9	-11.8
N	COMPAQ COMPUTER CORP	76	31	91.25	-2.6	-4.8
Q	COMPUTER AUTOMATION INC	17	9	11.88	-0.9	-4.0
A	COMPUTER CONSOLES INC	11	3	7.38	-0.9	-2.8
Q	CONCURRENT COMP CORP	24	11	17.50	-0.9	-2.8
N	CONTROL DATA CORP DEL	36	18	23.75	-2.9	-10.4
Q	CONVERGENT TECH	9	3	3.16	0.1	4.1
Q	CONVEX COMPUTER CORP	20	9	7.25	-0.9	-8.5
N	CRAY RESH INC	138	47	75.38	-4.5	-5.6
Q	DAISY SYS CORP	10	7	8.13	-0.3	-3.0
N	DATA GEN CORP	37	13	23.25	-1.1	-4.5
N	DATAPOINT CORP	6	3	5.25	-0.9	-4.6
N	DIGITAL EQUIP CORP	200	84	101.00	-7.4	-6.8
N	FLOATING POINT SYS INC	13	3	4.25	-0.9	-8.5
N	GOULD INC	24	9	11.00	-0.9	-7.4
N	HARRIS CORP	43	23	29.63	-1.2	-4.8
N	HEWLETT PACKARD CO	61	36	51.63	-2.3	-4.5
N	HONEYWELL INC	91	49	58.00	-0.3	-0.4
N	IBM	175	102	112.88	-2.8	-2.8
Q	INFORMATION INTL INC	16	9	12.75	-0.3	-1.5
Q	IPL SYS INC	3	1	1.63	-0.5	-27.2
Q	MASS COMPUTER CORP	14	4	4.88	-0.1	-1.3
N	MATSUSHITA ELEC INDL LTD	228	109	221.75	-5.0	-2.8
Q	MEGADATA CORP	6	3	3.00	-0.1	-4.8
Q	MENTOR GRAPHICS CORP	30	14	20.13	-1.8	-8.5
N	NBI INC	14	4	5.38	-0.5	-12.2
N	NCR CORP	87	50	58.75	-2.8	-5.0
N	PRIME COMPUTER INC	31	12	16.63	-1.4	-7.8
Q	PYRAMID TECHNOLOGY	13	9	12.00	0.8	4.3
Q	STRATUS COMPUTER	41	15	25.00	-2.0	-7.4
Q	SUN MICROSYSTEMS INC	46	14	37.13	-1.1	-2.8
Q	SYMBOLICS INC	9	1	1.75	0.0	0.0
N	TANDEM COMPUTERS INC	37	19	19.75	-1.1	-5.3
N	TANDY CORP	57	26	43.13	-1.0	-2.3
N	ULTIMATE CORP	37	13	13.50	-0.9	-6.1
N	UNISYS CORP	48	24	32.38	-2.8	-7.8
A	WANG LABS INC	19	10	11.50	-0.4	-2.6

Software & DP Services

Q	ADVANCED COMP TECH	9	1	1.50	-0.1	-4.0
N	ADVANCED SYS INC	35	13	18.00	0.0	0.0
Q	AGS COMPUTERS INC	30	11	17.38	0.1	0.7
Q	AMERICAN MGMT SYS INC	20	9	15.38	0.5	3.4
Q	AMERICAN SOFTWARE INC	30	3	13.00	-0.8	-5.8
Q	ANACOMP INC	11	3	9.50	-0.5	-5.0
Q	ANALYSTS INTL CORP	10	4	7.25	0.0	0.0
Q	ASHTON TATE	35	13	27.25	-2.6	-8.4
Q	ASK COMPUTER SYS INC	19	9	13.75	0.3	1.8
Q	AUTODESK INC	34	13	25.75	-2.1	-7.5
N	AUTO DATA PROCESSING	60	19	40.88	-3.5	-7.9
Q	BOOLE & BABBAGE INC	13	9	7.75	0.0	0.0
Q	COMPUTER ASSOC INTL INC	37	19	28.75	-2.9	-9.7
Q	COMPUTER HORIZONS CORP	19	7	11.13	0.6	5.9
N	COMPUTER SCIENCES CORP	73	42	42.50	-2.6	-7.8
N	COMPUTER TASK GROUP INC	17	9	11.50	0.6	5.7
Q	COGNOS INC	11	2	7.13	0.1	1.8
Q	COMSHARE INC	38	13	17.50	0.3	1.4
N	CULLINET SOFTWARE INC	14	4	7.00	-0.9	-9.7
Q	DUQUESNE SYS INC	22	10	19.50	0.6	2.8
A	DATA RESEARCH INC	10	7	13.75	0.0	0.0
N	GENERAL MTRS (CL E)	51	30	41.25	-1.8	-3.5
Q	HOGAN SYS INC	17	4	4.25	-0.4	-8.1
Q	INFORMIX CORP	31	12	16.63	0.8	3.3
Q	INTELLICORP INC	11	2	3.00	-0.1	-4.0
Q	KEANE INC	10	9	9.50	1.0	11.8
Q	LOTUS DEV CORP	40	19	23.00	-2.3	-8.5
Q	MANAGEMENT SCI AMER	10	9	7.38	-0.3	-3.6
Q	MICRO PRO INTL CORP	5	3	3.63	-0.9	-2.7
Q	MICROSOFT CORP	79	37	54.50	-2.8	-4.4
Q	MORINO ASSOCIATES INC	24	7	18	0.4	2.8
Q	NATIONAL DATA CORP	34	19	29.88	-1.1	-3.5
Q	ON LINE SOFTWARE INTL INC	22	8	9.88	-0.1	-1.2
Q	ORACLE SYS CORP	19	9	15.50	-1.5	-8.5
N	PANSOPHIC SYS INC	26	11	13.88	-0.5	-3.6
Q	POLICY MGMT SYS CORP	30	19	23.25	-3.0	-7.8
Q	PROGRAMMING & SYS INC	14	7	12.00	-1.8	-12.7
Q	REYNOLDS & REYNOLDS CO	36	14	20.38	-1.5	-7.4
Q	SD CORP	15	10	18.25	0.8	4.3
Q	SHARED MED SYS CORP	31	18	23.75	-1.5	-5.9
Q	SOFTWARE AG SYSTEMS INC	14	7	0.00	-7.0	-100.0
Q	SOFTWARE PUBG CORP	17	9	16.25	-0.3	-1.8
A	STERLING SOFTWARE INC	13	5	8.00	-0.4	-4.8
Q	SUNCARD DATA SYS INC	21	10	17.25	0.0	0.0
Q	SYSTEMATICS INC	32	19	30.75	0.5	1.7
N	SYS. SOFT INC.	24	7	15	0.0	0.0
Q	VM SOFTWARE INC	42	7	12.75	0.0	0.0

Semiconductors

N	ADV MICRO DEVICES INC	25	8	13.50	-0.5	-6.5
N	ANALOG DEVICES INC	24	9	13.13	-1.3	-8.7
Q	ANALOGIC CORP	13	5	7.38	0.1	1.7
N	INTEL CORP	42	18	31.25	-1.3	-3.8
Q	LSI LOGIC CORP	17	7	9.75	-0.9	-8.0
N	MOTOROLA INC	74	38	46.50	-1.5	-3.1
N	NATL SEMICONDUCTOR	22	10	12.13	-1.5	-7.8
N	TEXAS INSTRS INC	35	28	48.25	-4.6	-8.0
A	WESTERN DIGITAL CORP	33	11	14.50	-1.8	-8.3

Peripherals

Q	ALLOY COMP.	13	3	3.75	-0.5	-11.8
N	AM INTL INC	9	3	3.88	-0.1	-3.1
Q	ART RESH INC	31	3	15.88	-0.8	-4.8
Q	AUTO TROL TECH CORP	9	3	4.63	-0.1	-2.6
Q	BANCTEC INC	19	9	8.25	-0.5	-5.7
Q	CIPHER DATA PRODS INC	14	4	9.88	-0.1	-1.3
A	COGNITRONICS CORP	9	3	3.25	0.0	0.0
N	COMPUGRAPHIC CORP	28	15	25.75	-0.5	-1.9
A	DATAPRODUCTS CORP	24	7	8.13	-0.5	-5.8
A	DATARAM CORP	N	5	7.88	0.0	0.0
N	DECISION INDS CORP	13	4	10.75	-0.1	-1.1
N	EASTMAN KODAK CO	71	29	40.00	-2.6	-6.5
Q	E M C CORP MASS	25	10	13.75	-0.5	-3.5
Q	EMULEX CORP	9	4	8.13	-0.9	-3.0
Q	EVANS & SUTHERLAND	35	19	18.38	-2.6	-12.5
Q	ICOT CORP	9	3	3.50	-0.4	-2.7
Q	INTERLEAF INC	24	11	18.25	-0.1	-0.7
Q	IOMEGA CORP	9	1	3.88	-0.2	-5.0
Q	LEE DATA CORP	9	3	3.63	-0.3	-8.0
Q	MAGNETOR SYS CORP	9	1	2.88	-0.4	-11.5
Q	MAXTOR CORP	33	9	14.63	-0.6	-4.1
Q	MICROPOLIS CORP	44	13	23.75	-1.5	-5.5
Q	MICROTOUCH CORP	18	9	11.50	0.0	0.0
N	MINNESOTA MINES & MFG CO	84	65	68.88	-3.1	-4.3
A	MSI DATA CORP	10	3	16.50	-0.5	-2.8
Q	PERSONAL COMPUTER PRODUCTS INC.	7	4	9.13	0.1	2.1
Q	PRIAM CORP	9	1	2.00	0.0	0.0
Q	PRINTRONIX INC	13	7	8.88	0.0	0.0
N	QMS INC	27	8	10.13	-0.1	-1.3
Q	QUANTUM CORP	38	8	11.00	-0.5	-4.3
N	XIDEX CORP	8	4	4.25	0.0	0.0
N	RECOGNITION EQUIP INC	22	7	8.75	-0.5	-5.4
Q	REXON INC	14	9	8.13	-0.3	-3.0
Q	SCAN TRON CORP	17	7	16.38	-0.1	-0.9
Q	SEAGATE TECHNOLOGY	46	15	16.38	-3.6	-16.5
N	STORAGE TECH CORP	9	1	1.63	-0.3	-13.3
Q	TANDON CORP	7	1	2.25	-0.5	-12.2
A	TEC INC	7	3	4.75	-0.1	-2.6
N	TEKTRONIX INC	41	21	28.13	-1.8	-6.9
Q	TELEVIDEO SYS INC	3	1	1.25	0.0	0.0
N	TELEX CORP	52	35	46.63	-0.5	-1.5
Q	WYSE TECH	40	11	18.13	-1.0	-5.5
N	XEROX CORP	86	66	83.13	-2.9	-3.1
Q	XIDEX CORP	16	9	9.13	-0.5	-7.5

Leasing Companies

Q	CAPITAL ASSOCIATES INTERNATIONAL INC	11	4	4.88	-0.1	-1.3
N	COMDISCO INC	37	12	31.25	-2.1	-6.1
N	CONTINENTAL INFO SYS	14	9	7.75	-0.1	-1.8
Q	PHOENIX AMERN INC	8	2	3.88	-0.1	-4.2
Q	SELECTERM INC	9	3	4.25	-0.3	-6.8

EXCH: N—NEW YORK; A—AMERICAN; Q—NATIONAL; O—OVER-THE-COUNTER; S—SPLIT

Q-T-C PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID

Mixed bag

Futures trading turbulent; Tandy thrives, DEC in dumps

A late-week round of futures-related trading canceled out earlier gains and later losses, causing the market to close mixed on Thursday and raining on the parade of technology industry stocks that got early boosts from generally strong first-quarter earnings.

Tandy Corp. walked away from the week a winner, up 2¾ points to 45¾ on the strength of introductions of an IBM Personal System/2 clone and a read-write optical storage technology product. IBM, riding the wave of its surprising first quarter started the week at 114⅛ points but dropped to 112⅝ by Thursday's close.

Apparently unaided by the well-received rollout of a new line of VAXs and the long-awaited enhancements of its VMS operating system, Digital Equipment Corp. dropped to below $100 per share at Thursday's close to 99⅝ — almost 100 points below its 52-week high of 199½.

Robust quarterly reports notwithstanding, Sun Microsystems, Inc. closed down ¾ of a point; Apollo Computer, Inc. was down 1⅜; Lotus Development Corp. dropped 1¼; and Apple Computer, Inc. closed at 39½ — exactly where it opened.

NELL MARGOLIS

DB2

FROM PAGE 1

He said IMS Full Function and IMS Fast Path should be reserved for the heaviest transaction processing loads, those requiring several hundred to 1,000 transaction/sec.

At the same time, IBM officials announced that the ESA operating system will be the focus of future development for both IMS and DB2, giving a broad segment of the IBM customer base a shove toward its highest powered, highest priced products — the ESA operating system and the E series of the 3090 mainframe line.

"All future enhancements to IMS 2.2 will be done in the ESA environment only," said Bill Wilson, group director of IBM's large systems management in Rye Brook, N.Y.

MVS/ESA was announced in February as Version 3.0 of MVS/SP, the core MVS operating system (Version 2.0 was MVS/XA). The first part of ESA will become available in August, with the Data Facility Product piece becoming available at the end of the year. Its benefits were only superficially glimpsed at the time, but it is now evident that ESA and DB2 are developing in lockstep, one observer said.

Twin killing

ESA expands the virtual memory available by a factor of 8,000; it also reduces the importance to a DB2 programmer of knowing where data is located.

"If you have an ESA system in operation 24 hours a day with uninterruptible power, DB2 could load a data base into main memory at the start of the week, unload it at the end of the week, and nobody would be the wiser," said Per O. Flaatten, a technology researcher at Arthur Andersen & Co. in Chicago.

IBM tagged the performance gain with Version 2.0 at 51% over its predecessor, Release 1.3, announced a year ago. But the increase is likely to be viewed as much greater by most customers, if they can come within hailing distance of the 186 transaction/sec. cited by IBM.

Most DB2 users have found their applications stay below the 47 to 52 transaction/sec. benchmarked by IBM when Release 1.3 was first announced in May 1987. More recently, IBM engineers under lab conditions boosted DB2 Version 1.3 throughput up to 123 transaction/sec. by using almost all the capacity of a 3090 Model 600E.

The claim of a 51% increase for Version 2.0 is thus a conservative one based on a comparison with the highest lab test figure for its predecessor. To users currently in the 40 to 45 transaction/sec. range, the increase, if approximated in their applications, would appear closer to 300% or 400%.

The 186 transaction/sec. figure met both praise and skepticism from users. "It appears to be a very significant performance improvement," said Ed McDonald, information processing division manager of Texaco, Inc.

The announcement, in fact, provided a much larger transaction figure. The 186 transaction/sec. figure was cited for a "typical" transaction environment. The typical transaction consisted of 12 SQL calls and seven physical I/Os. Version 2.0 also executed up to 438 transaction/sec. for the simpler credit authorization transaction consisting of one SQL call, one or two updates and a write, said Gary J. Ferdinand, IBM's manager of advanced data base products.

"There are too few large applications in use today to tell whether a lab benchmark is representative," Arthur Andersen's Flaatten said.

Speed levels

Russell Donovan, IBM's data base products marketing manager, said the largest IMS Full Function customers process 75 to 80 transaction/sec. and that the largest IMS Fast Path customers, such as money center banks, process 178 transaction/sec. IBM has obtained much higher rates in its own laboratory benchmarks.

The efficiencies of the ESA operating system account for about 13% of the DB2 performance gain. Other changes to DB2 include the following:

- Referential integrity in the form of support for foreign and null keys is provided. The data manager now enforces primary and secondary data relationships between records in separate tables rather than leaving the task to the application programmer.
- The DB2 optimizer has been improved to allow more sophisticated access-path selection and reduced need for I/Os.
- The DB2 sort utility has been improved to lower the number of merge passes required on a sort and reduce CPU cycles.
- Batch processing and load utilities have been improved.
- The audit facility can provide an audit trail of DB2 activities and a record of attempted security violations.
- Groups, rather than individuals, can be defined in IBM's security software, RACF, and the definitions passed into DB2.
- A resource limit facility, or governor, is added; it limits the CPU resources taken by a dynamic SQL query. A data base administrator may specify a maximum for all queries or how long one user's queries may run.

Version 2.0 is expected to be available in October for a monthly license charge of $3,600.

Midwest correspondent Jean S. Bozman contributed to this report.

Zenith adds 386-based laptop

BY ALAN J. RYAN
CW STAFF

NEW YORK — A battery-powered laptop based on Intel Corp.'s 80386 processor highlighted Zenith Data Systems' announcement of three portables last week.

Zenith, along with NEC Corp. and Toshiba Corp., has captured a large share of the laptop market by packing desktop power into increasingly small machines.

Although laptop sales are surprisingly low when compared with conventional desktop personal computers, their numbers are growing, according to Bruce Stephen, an analyst with International Data Corp. (IDC) in Framingham, Mass. IDC estimates that 370,000 IBM and compatible laptops shipped in 1987, a figure that was sizable compared with the previous year, Stephen said. "It's not a huge market yet, but [1987] was a healthy year for laptops, and we expect this year to be the same," he said.

The Zenith laptops are the Turbosport 386, the Intel 80286-based Supersport 286 and the Intel 8088-based Supersport.

The Turbosport 386, set to be available in June for $7,999, features Zenith's high-contrast Page White display.

Additionally, the 12.5-MHz Turbosport offers a battery-operable 40M-byte hard disk drive. The machine also sports a 1.44M-byte 3½-in. floppy disk drive. The Power-Miser hard disk, developed by Zenith and Conner Peripherals, Inc. in San Jose, Calif., consumes approximately one-third less power than previous drives, according to Zenith President John Frank.

The 386-based portable, with a battery life of more than two hours, weighs less than 15 pounds without the battery, comes with 2M bytes of memory and is expandable to 3M bytes, Zenith said. Turbosport will also be available with an internal 2,400 bit/sec. modem for $8,499.

The features

All three portables have serial and parallel ports, external video output, a numeric keypad port, an external disk drive port, an expansion chassis connector, an internal modem slot and a math coprocessor socket. The 12-MHz Supersport 286 will be available with a 40M- or 20M-byte hard disk drive, selling for $5,599 and $4,999, respectively. Both versions will be available in May, the company said.

The 286-based model offers one 1.44M-byte 3½-in. floppy disk drive and 1M byte of random-access memory expandable to 2M bytes with both Lotus/Intel/Microsoft Expanded Memory Specification and extended memory capabilities.

The third offering, available in an 8- or 4.77-MHz 8088-based version, is the Supersport. A dual 720K-byte 3½-in. floppy disk drive model is available for $2,399, and a 20M-byte model will sell for $3,599.

Lapping it up

In 1987, Zenith was the second largest supplier to the still relatively small market for IBM-compatible laptops

INFORMATION PROVIDED BY INTERNATIONAL DATA CORP.
CW CHART

The changing face of MVS

IBM is making sweeping upgrades on its major MVS subsystems, including IMS, TSO, JES2, JES3 and Data Facility Hierarchical Storage Manager (DFHSM), to make greater use of virtual memory and automatic memory management under its MVS/ESA operating system, company officials said last week.

In addition to actual subsystem functions, said Jim Henderson, IBM director of Application Enabling Software, the upgrades also provide large MVS users with virtual memory constraint relief by taking advantage of ESA's data space virtual memory.

IMS/VS Version 2.2 uses ESA hiperspaces — virtual memory data spaces reserved for specific functions — as extensions on the current VSAM buffer pool. Hiperspaces may be located in internal expanded storage, where their swift response time and elimination of the need for I/O speeds system operation.

The new version is planned for general availability in December at no change in price, according to IBM.

TSO/E has been given support for Rexx, a procedural language that is easier to code than Clist.

TSO/E has also been given the capability to use the Virtual Lookaside Facility to reduce data set I/O and direct-access storage device contention.

TSO/E Version 2.0 is scheduled to be available in the fourth quarter of this year at a monthly license charge of $700 or a one-time charge of $21,000 to $33,600, depending on processor size.

DFHSM Version 2.4 allows a storage administrator to logically manage data at the smaller data set level rather than the file or volume level, Henderson said.

DFHSM is scheduled to be available Dec. 30 at a monthly license charge of $800 or a one-time charge of $24,000 to $38,400.

JES2 Version 3 Release 1.1 and JES3 Version 3 Release 1.1 and 1.2 will be given the capability to be dynamically reconfigured rather than shut down for new configuration parameters, Henderson said.

JES2 and JES3 are set to be available in December at monthly license charges of $4,800 and $5,400, respectively. Their one-time charges will range from $163,200 to $259,200 for JES2 and $183,000 to $291,600 for JES3.

CHARLES BABCOCK

Hungry users drive RISC demand

BY JULIE PITTA
and ED SCANNELL
CW STAFF

NEW YORK — RISC technology took another leap forward in its bid to become an alternative processor technology with the announcement of Motorola, Inc.'s 88000 series of reduced instruction set computing chips.

More than 20 vendors have signed up to use Motorola's RISC microprocessors, including Data General Corp. (see story below). The insatiable appetites of workstation and supermini users for powerful systems has spurred the growth of RISC technology.

"RISC is tailored for high-speed operations," said Alice Leeper, an industry analyst at Dataquest, Inc. "We're seeing an ever growing demand for more megahertz and MIPS."

Fulfilling potential?

Although more expensive than Motorola's current line of microprocessors and Intel Corp.'s microchip sets, RISC can offer system designers the possibility of better value because of its performance potential and the relatively simple architecture.

Last week's announcement places Motorola in competition with one of its largest customers, Sun Microsystems, Inc., which is promoting its own version of RISC called Scalable Processor Architecture (Sparc).

Sun released Sparc last year and has since licensed its technology to such vendors as Xerox Corp., Unisys Corp. and AT&T. Apollo Computer, Inc., Hewlett-Packard Co. and IBM use internally developed RISC microprocessors in their workstations.

"On the surface, there are an awful lot of players right now," said Rich Edwards, senior industry analyst at Robertson, Colman & Stephens. "But it should shake out to two or three players." He predicted that Motorola's RISC processors and Sun's Sparc will dominate the market.

Will Apple bite?

Motorola's largest customer, Apple Computer, Inc., has not committed to RISC technology. However, industry observers say Apple will eventually offer a RISC system to compete against vendors like Sun in the higher end workstation market.

Motorola's 88000 series, which performs at between 14 and 17 million instructions per second (MIPS), includes the 88100 and 88200 Cache/Memory Unit. The latter product offers a single-chip approach to cache memory design, a critical element in RISC-based systems, a spokesman said.

Along with the 88000 chip, Motorola also introduced Hypermodules, a series of 88000 multiprocessor boards that provide up to 50 MIPS on a single board.

DG earnings do about-face

WESTBORO, Mass. — Data General Corp. reported net income last week of $17.2 million for its second quarter ended March 26, a marked contrast to the $42.6 million net loss for the comparable quarter last year. Sales were up 10.9% from last year's $315.2 million to $349.7 million.

"The only problem with the picture is that [profit] includes a $5.9 million nonrecurring gain from the sale of a company building — so it's not as good as it looks," said Joseph Payne, who follows DG at Alex Brown & Sons, Inc. in Baltimore.

In a prepared statement, DG President Edson de Castro emphasized improved operating income — $20.1 million, or 5.7% of revenue, compared with a $9 million operating loss in the second quarter of 1987.

De Castro noted that "operating income has improved for the third consecutive quarter, primarily as a result of increased shipments and the benefits of cost-cutting measures" implemented last year.

"Another bumpy quarter for Data General," Payne said.

However, he added, "recent indications from the Data General sales force are that better days are coming."

DG in Motorola fold

BY ALAN ALPER
CW STAFF

NEW YORK — Data General Corp. last week disclosed that it will use a reduced instruction set computing (RISC) chip set designed by Motorola, Inc. in a broad series of Unix-based systems it expects to roll out beginning in mid-1989.

The Westboro, Mass.-based firm also said it and Motorola are co-developing an implementation of Motorola's 88000 chip set in emitter-coupled logic (ECL) technology. The ECL chip set would let DG build systems providing more than 100 million instructions per second of raw performance, DG claimed. The set is slated to come out in 1991.

DG declined to sketch out its RISC-based series beyond saying the systems will run DG/UX, its implementation of the AT&T Unix System V and will likely consist of workstations and single- and multiprocessor systems.

DG went to great lengths to emphasize its commitment to the MV/Eclipse hardware platform and the AOS/VS proprietary operating system and said the company is currently developing the next two generations of its MV/Family systems.

MV/Eclipse systems will appeal to many DG customers in the near term because of their functionality and breadth of applications, DG officials said.

But the company is preparing for the day when RISC-based systems fulfill most customer needs. DG is planning to build bridges that would enable MV/Eclipse users to migrate to its RISC-based systems. "That would include common data base management systems and high-level languages," said DG Vice-President of Corporate Marketing Ward MacKenzie.

"Forgetting about the new business opportunities it will provide, we realize that if we don't offer [RISC-based systems], we will lose customers," MacKenzie concluded.

Mistrial

FROM PAGE 1

able using optical technology.

"We discovered that attorneys would come to court with many copies of different documents, because that's what they are used to in preparing for court," explained Warren Slocum, San Mateo County Clerk-Recorder and Administrative Clerk of the Superior Court. As a result, the attorneys were bypassing the optical system and continuing to rely on traditional paper documents.

Most significant, however, was the refusal by many witnesses to testify under oath that the documents shown to them on a display screen were in fact the documents in question, Slocum said. Several witnesses said they were uncomfortable identifying a digital image as a legal document and preferred to see the paper document before testifying to its validity.

Let down

San Mateo County officials and optical storage analysts alike said they were surprised at the disappointing results in this pioneering case.

"It's too bad it didn't work out, because this was a magnificent pioneering effort, well worth the experiment and a little sad that the human aspects of it were not paid a little more attention to," said Dick Zech, president of Zech Tech International, an optical storage consulting firm in San Mateo.

"Most of the controversy surrounding optical has had to do with the validity of evidence once it's been changed from its original medium and stored into a digital medium," Zech said. "This situation moves more to the core of the matter, however: Are people willing to swear under oath that the information they see on the screen is the same information they once saw in the form of paper?"

Shell's lawsuit against dozens of its insurance carriers promised to be an enormous undertaking from the start. With damage claims from toxic waste incidents between 1947 and 1982 involved, the paperwork was overwhelming. San Mateo County converted a closed high school into a courthouse and spent some $314,000 derived from a state automation fund to acquire the system.

Earlier this month, the Filenet system was moved from the courthouse in San Bruno to the San Mateo County Clerk-Recorder offices in Redwood City, where it will begin to take over where microfiche storage left off. Eventually, Slocum said, the system will be integrated into a state-of-the-art courtroom, complete with video and on-line terminals, now under construction.

Documents related to the Shell trial will still be stored on the system, he said. The Filenet system operated in stand-alone mode in the courtroom, as it will in the clerk-recorder offices.

Second-class postage paid at Framingham, Mass., and additional mailing offices.
Computerworld (ISSN 0010-4841) is published weekly, except: (5) issues in February, May, August and October, (5) issues in January, March, April, June, July, September and November and (4) issues in December with a single combined issue for the last week in December and the first week in January of 1989 by CW Publishing/Inc., 375 Cochituate Road, Box 9171, Framingham, Mass. 01701-9171.
Copyright 1988 by CW Publishing/Inc. All rights reserved.
Computerworld can be purchased on 35 mm microfilm through University Microfilm Int. Periodical Entry Dept., 300 Zeeb Road, Ann Arbor, Mich. 48106. *Computerworld* is indexed: write to Circulation Dept. for subscription information.
Photocopy rights: permission to photocopy for internal or personal use or the internal or personal use of specific clients is granted by CW Publishing/Inc. for libraries and other users registered with the Copyright Clearance Center (CCC), provided that the base fee of $3.00 per copy of the article, plus $.50 per page is paid directly to Copyright Clearance Center, 21 Congress Street, Salem, Mass. 01970.
Permission to photocopy does not extend to contributed articles followed by this symbol, ‡
Special requests for reprints and permission should be addressed to Nancy M. Shannon, CW Publishing/Inc., 375 Cochituate Road, Box 9171, Framingham, Mass. 01701-9171. Subscriptions call toll free (800) 255-6206 or in New Jersey call (800) 322-6266.
Requests for missing issues will be honored only if received within 60 days of issue date. Back issues, if available, are charged at $2.00 per issue, plus postage.
Subscription rates: $2.00 a copy; U.S. — $44 a year; Canada, Central & So. America — $110 a year; Europe — $165 a year; all other countries — $245 a year (airmail service). Four weeks notice is required for change of address. Allow six weeks for new subscription service to begin.

ABP

POSTMASTER: Send Form 3579 (Change of Address) to *Computerworld*, Circulation Department, P.O. Box 1566, Neptune, NJ 07754-1566.

Tandy adds erasable CD

NEW YORK — Tandy Corp. showcased an erasable optical disk last week that is compatible with current compact disk/read-only memory (CD-ROM) and compact audio disk formats and is expected to be available within 18 to 24 months.

The disk will initially be aimed at the consumer audio market, although it is also expected to be used as an erasable mass storage medium for computers.

Like CD-ROMs, digital information is stored on the Thor-CD using a laser beam to create microscopic pits in a light-reflecting surface. Unlike CD-ROMs, the pits can be erased, allowing editing and re-recording on the same disk, the Fort Worth, Texas, company claimed. Tandy could not say how many record and erase cycles Thor-CD would accommodate before its performance would degrade.

Thor-CD is expected to store "hundreds" of megabytes of data by the time storage devices are available early in the 1990s. Thor-CD players and recorders are likely to offer an average access time and data transfer rate comparable to CD-ROMs. Tandy said it was premature to say how much the disk will cost in volume production but claimed it will be less expensive than existing digital audio formats.

ALAN ALPER

TRENDS

IBM's 9370

IBM's newest mini takes its biggest bite from System/36, 38

PLANNED MARKET SHARE AT U.S. IBM MAINFRAME SITES

Once perceived as IBM's strategic mid-range machine and defender of IBM's accounts against encroachments by Digital Equipment Corp.'s VAX processors, a recent study shows the IBM 9370 to be generating little enthusiasm and winning virtually no market share against DEC.

Recent statistics compiled by Focus Research Systems, Inc. in West Hartford, Conn., support the conclusion that IBM's 9370 is off to a rocky start.

Focus Research followed up on interviews it did a year ago to determine 9370 buying intentions and found that 35% of those sites had reconsidered and decided not to purchase the 9370.

Historically, the fulfillment rate for planned hardware purchases is more than 80%, according to Focus Research.

Educational institutions, software vendors and state and local governments make up 40% of the total number of 9370 sites, and many of these sites are being given special trial arrangements by IBM, Focus Research said.

Only one site interviewed by the research firm had purchased more than one system.

In addition, 85% of all sites have not distributed the processor outside of the MIS department.

This runs counter to the kind of use for which IBM has said the machine is best suited — departmental computing.

Two-thirds of the sites said the 9370 was a stand-alone machine and was not networked to another machine. On the plus side, however, most 9370 users said they were satisfied with the machine.

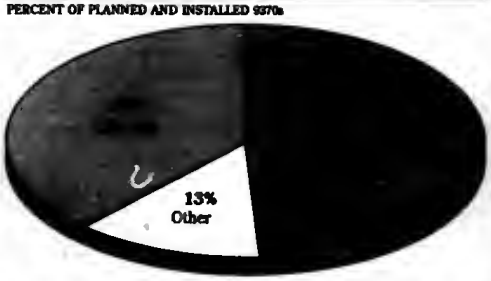
STANLEY GIBSON

Businesses hedge on buying plans

PERCENT OF USERS WHO PLANNED PURCHASE

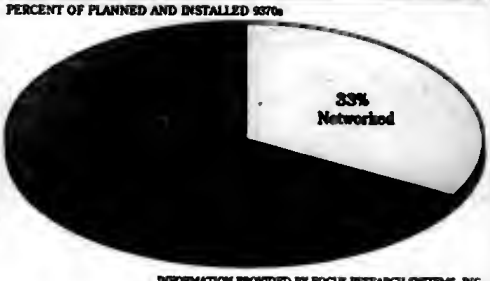
DOS reigns as primary operating system

PERCENT OF PLANNED AND INSTALLED 9370s



Stand-alone use preferred

PERCENT OF PLANNED AND INSTALLED 9370s



INFORMATION PROVIDED BY FOCUS RESEARCH SYSTEMS, INC.
CW CHARTS

INSIDE LINES

Mani makes Lotus numero uno — in compensation. Microsoft may have eclipsed Lotus as the biggest independent microcomputer software firm, but that didn't keep Lotus President Jim Manzi from climbing to the top spot in *Business Week*'s annual survey of executive compensation, as reported in that magazine's May 2 issue. With a total of $26.3 million from salary, bonuses and stock options in 1987, Manzi's take for the year was equal to 36% of the company's total profit for 1987 and good enough to bump the irrepressible Lee Iacocca, chairman of $26.3 billion Chrysler Corp., into second place.

The employees haven't given up. Computer Corporation of America (CCA) reached a preliminary agreement late Friday with its parent company, Crowntek, Inc. in Toronto, that would allow CCA employees to buy majority ownership of the company. Under terms of the agreement, which has not been finalized, Crowntek would continue to hold a minority position in CCA.

The lawyers must be busy elsewhere. Hewlett-Packard will unveil microcomputer systems at Comdex/Spring '88 in Atlanta, the company confirmed last week. Sources say the HP Vectra line could be extended with a 25-MHz Intel 80386-based desktop and possibly a lower priced Intel 80286-based model. Some users are hoping for a new HP laptop as well. At any rate, the Comdex micro announcements are not expected to involve IBM Micro Channel compatibility. "We have a Micro Channel project in the labs, but we're not positioned to show anything yet," said Bill Johnson, HP's PC marketing manager.

A packet-switching PAC. The Federal Election Commission gave Telenet Communications, the data networking unit of U.S. Sprint, permission to form its own political action committee (PAC). However, according to the "PACs & Lobbies" newsletter, the very complex ruling says Telenet must coordinate its gifts with Sprint's parents, GTE and United Telecom, so that neither parent exceeds the $5,000 limit on PAC contributions. Got that?

Who really has it now? In what could be a preemptive strike against DEC, its much larger rival, Stratus Computer will announce today what it claims is a high-performance relational data base product for on-line transaction processing (OLTP). The product will be based on Sybase technology. Stratus said it will also unveil its strategy for integrating personal computers and workstations into OLTP environments. DEC has been talking lately about its upcoming enhanced OLTP capabilities but has yet to produce anything.

And they say this industry is colorless. A book that attempts to detail the birth of IBM's Systems Application Architecture (SAA), written by Michael Killen, a Palo Alto, Calif., market analyst, is scheduled to be published in mid-June by Harcourt Brace Jovanovich. While attempting to shed light on the conceptualization of SAA, it reads something like the software version of *Raiders of the Lost Ark*. Protagonists' movements are cited in detail as they fly from one IBM installation to another. The author seems smitten by color, as in the original green, red, blue and yellow color scheme for SAA: "Olive-complexioned Mike Serrago — jacket off and looking sharp in his powder-blue shirt — got up and stood by the projector. [Don] Casey may have liked yellow, but Mike apparently liked red. It was on every one of his transparencies."

No standardization here. Amdahl may finally announce its version of IBM's 3090 K Model direct-access storage device (DASD) disk drive. Like National Advanced Systems, which announced that its K Model-type DASD will feature 9½-in. platters — in contrast to IBM's 14-in. ones — Amdahl is likely to announce a 10½-in. platter, according to sources. Sounding like the State Department, Amdahl would not "confirm or deny" the product's introduction in early May or its use of 10½-in. platters.

You could help make News Editor Pete Bartolik as valuable to us as Jim Manzi is to Lotus. Call 800-343-6474 or 617-879-0700 with your tips, or we'll consider his options.

Sorbus™ 386 service: In unfamiliar waters, reach for an old friend.

If you're not as sure about those new 386-based machines as IBM® and Compaq® are, here's something you *can* be sure about: Sorbus is ready to take good care of them.

Which means we're ready to take good care of you, too. As always.

Now your shiny new PS/2™ and 386™ models can get many of the service options we offer for most every other kind of personal computer. We already service more than 180,000 units of PC equipment; altogether, we maintain 3,000 kinds of computer equipment from more than 400 manufacturers.

And more IBM equipment than anybody else in the world. (Except IBM, but we're working on it.)

So go on, jump right into that new 386 world. You'll find an old friend there–when you need us most.

For more information, call Sorbus at 1-800-FOR-INFO.

Sorbus℠
A Bell Atlantic™ Company

50 E. Swedesford Road
Frazer, PA 19355

Sorbus is a service mark of Sorbus Inc.

IBM is a registered trademark of International Business Machines Corporation.

Compaq is a registered trademark of Compaq Computer Corporation.

An important message about customer-controlled software. Because this is the most important operating system of all.

It goes without saying that a software package has to support the latest operating systems, processing environments, databases and the like.

Less obvious to the average business software company, however, is the need for their applications to work with you. And all the people who sit at terminals in your company.

The ones expected to meet tight reporting deadlines despite having to learn a new system. The DP staff turned miracle-workers. The managers who have to answer for lost productivity.

At McCormack & Dodge, our commitment to the latest technology never outweighs our obligation to you.

Five years ago, when you needed to integrate business applications, we responded with Millennium. Today, that technology has evolved into customer-controlled software. The answer to your call for even more flexibility.

Customer-controlled software gives you the flexibility to make the system whatever your business needs it to be. Take our General Ledger package. A manufacturer might turn it into a product line reporting system, while a retailer sets it up as a weekly stock ledger, and an insurance user makes it a statutory ledger system.

It's all accomplished without disrupting your staff, your DP department, or your business. And it all comes from a software company consistently rated by Fortune 500 executives as a top vendor in overall service and support.

The message is simple. Customer-controlled software makes everybody's job easier. To find out more, or to inquire about any of our Financial, Human Resource, Manufacturing and Application Development software, call McCormack & Dodge at 1-800-343-0325.

We put the customer in control of the software.

McCormack & Dodge

a company of The Dun & Bradstreet Corporation

We put the customer in control of the software.